

May 29, 2020

Steve Moskal  
BP America Production Company  
1199 Main Ave Suite 101  
Durango, CO 81301

**RE: Tiffany Gathering  
May 2020 Vegetation Monitoring**

Dear Mr. Moskal,

Cottonwood Consulting LLC (Cottonwood) is pleased to provide you with the results of the vegetation monitoring conducted on May 21, 2020 at the Tiffany Gathering site. Details regarding the monitoring and results are summarized below.

### **Background**

A release occurred from a BP America Production Company (BP) pipeline known as the Tiffany Gathering in April 2020. Produced water was released and flowed across a hay field to an irrigation-influenced wetland, where the flow terminated. Soil sampling conducted on April 8, 2020 indicated that conductivity and SAR (sodium adsorption ratio) exceeded the Colorado Oil & Gas Conservation Commission Table 910-1 (COGCC) standard in some of the samples, but no hydrocarbons were detected above the COGCC Table 910-1 standard. BP received approval to perform monthly vegetation monitoring through the 2020 growing season to assess vegetative conditions within the flow path. Cottonwood conducted the first monthly monitoring event in May 2020.

Based on a review of the National Resources Soil Conservation Service Web Soil Survey, the primary soil type within the project area is the Bayfield silty clay loam, 1-3 percent slopes. The Bayfield silty clay loam is considered prime farmland if irrigated and drained.

### **Methodology**

On May 21, 2020, a Cottonwood staff biologist conducted vegetation transect monitoring at the Tiffany Gathering release site. Cottonwood utilized the BLM's Line-point Intercept method to quantify soil cover, including vegetation, litter, rock and biotic crusts. Specific methodology can be referenced from *Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems* (Herrick et al., 2005). Two transects were located within the release area. Transect 1 was 100 feet long and located within the wet area in the hay field. Transect 2 was located within the irrigation-influenced wetland area and was divided into two segments in order to more accurately follow the flow path. The first segment was 56 ft long and the second segment was 44 ft long.

Vegetation cover was recorded by species to the extent practicable and the data were analyzed to determine percent (%) canopy cover, % bare ground, and species composition. Photographs were also taken from either end of the transect line.

Transect locations and vegetative cover are provided in Table 1, a map of the project site with the transect locations can be found in Figure 1, photographs of the transects are provided in Attachment 1, and vegetation transect data can be found in Attachment 2.

## **Results**

**Table 1. Vegetation Monitoring Results**

| <b>Transect</b>          | <b>Azimuth</b> | <b>Location</b> | <b>Vegetative Cover<br/>May 2020</b>       |
|--------------------------|----------------|-----------------|--|
| 1<br>37.06387/-107.53212 | 342°           | Flow path       | Vegetation Cover = 66%<br>Bare Ground = 6% |
| 2<br>37.06413/-107.53228 | 340°/346°      | Flow path       | Vegetation Cover = 66%<br>Bare Ground = 0% |

Notes: Vegetation Cover includes all points with a top canopy present. Bare Ground includes points with no top or lower canopy present and only soil at the soil surface.

Vegetative cover was 66% in both Transect 1 and Transect 2 during the May 2020 vegetation monitoring event. Bare ground made up 6% of Transect 1 and there was no bare ground observed in Transect 2. Minor white soil crust was also observed along Transect 1. Tire tracks were observed in some areas within Transect 1 and portions of transect were saturated with irrigation water. Transect 2 was located within an irrigation-influenced wetland area with flowing water.

## **Conclusion**

Based on vegetation monitoring conducted on May 21, 2020, the vegetation within the flow path on the Tiffany Gathering site is consistent with seasonal conditions and surrounding vegetative conditions.

Future monitoring events will be used to evaluate potential site changes over time. The next monitoring event is scheduled for June 2020.

Should you have any questions, please do not hesitate to contact me at 970-764-7356. Cottonwood appreciates the opportunity to provide services to BP.

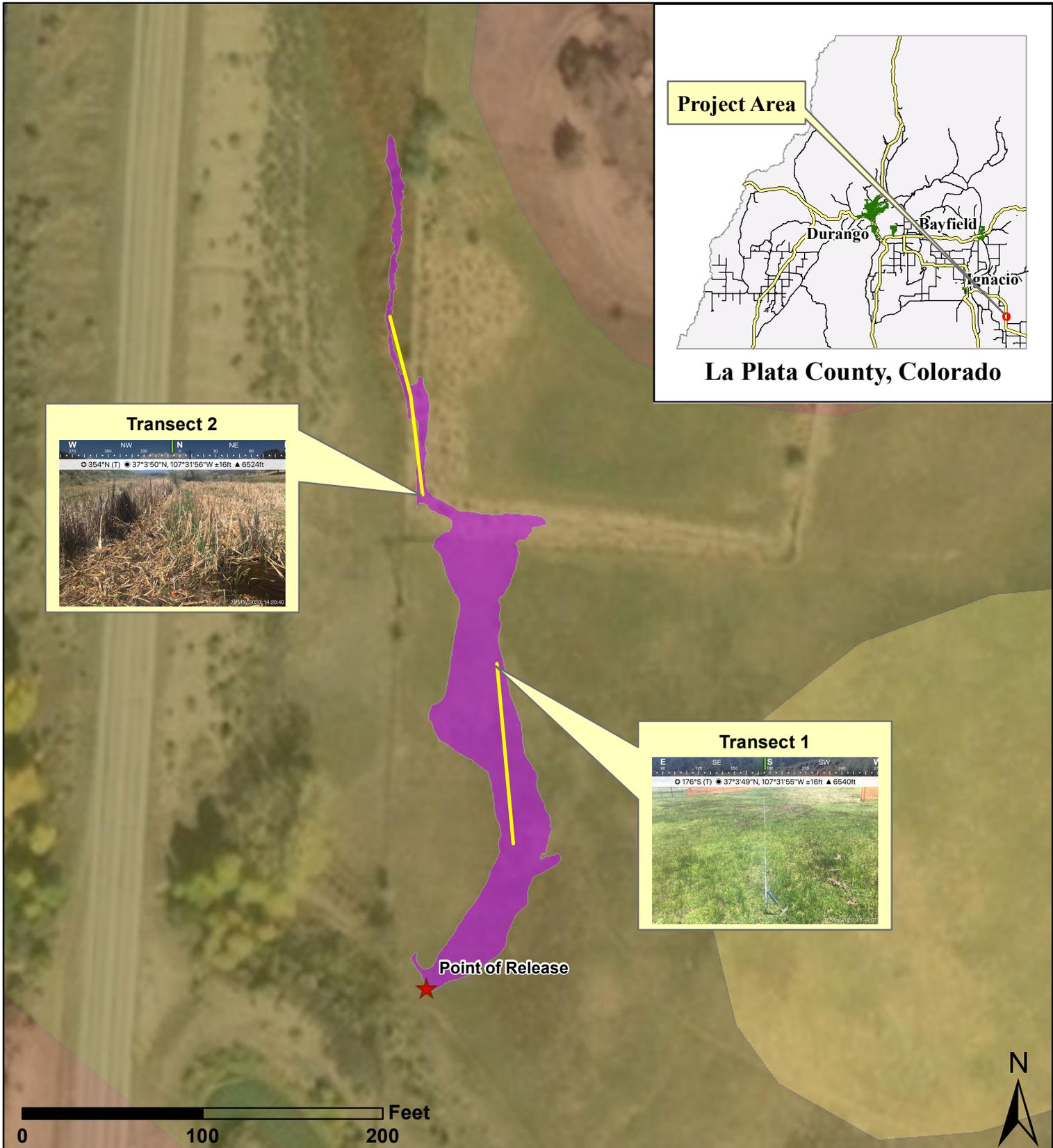
Sincerely,



Kyle Siesser, P.G.  
Cottonwood Consulting LLC

Attachments: Figure 1 – May 2020 Vegetation Monitoring Map  
Attachment 1 – Photo Log  
Attachment 2 – Line-Point Intercept Data Forms and Species Table

**FIGURE 1**



**Project Area**



**La Plata County, Colorado**

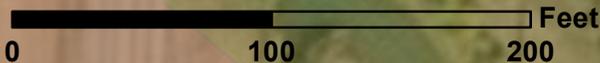
**Transect 2**



**Transect 1**



**Point of Release**



**Legend**

- Point of Release
- Vegetation Transects
- Wet Area (4/8/2020)
- Soil Type**
- Bayfield silty clay loam, 1-3%
- Sili clay loam, 3-6%
- Zyme clay loam, 3-25%



Mapping by: E. Millar, 5/29/2020  
 Coordinate System:  
 NAD 1983 UTM Zone 13 N  
 Location: Sec 32 T33N R6W NMPM

**Tiffany Gathering  
 May 2020  
 Vegetation Monitoring Map  
 BP America Production Co.**

**ATTACHMENT 1**



Photo 1: Start of Transect 1, 5/21/2020.



Photo 2: Start of Transect 2, 5/21/2020.

**ATTACHMENT 2**

**Line-Point Intercept Data Form  
Transect T1  
Tiffany Gathering  
BP America Production Company**

**Project:** Tiffany Gathering  
**Transect:** T1  
**Direction:** 342°  
**Date:** 5/21/2020

**Observer:** EM  
**Recorder:** KGS  
**Transect Length:** 100ft  
**Spacing Interval:** 2ft

| Pt. | Top Canopy | Canopy Layers | Soil Surface | Pt. | Top Canopy | Canopy Layers | Soil Surface |
|-----|------------|---------------|--------------|-----|------------|---------------|--------------|
| 1   | Timothy    | Rush          | EL (w)       | 26  | Timothy    | -             | EL (w)       |
| 2   | Timothy    | -             | EL (w)       | 27  | Rush       | Timothy       | EL (w)       |
| 3   | Timothy    | -             | EL (w)       | 28  | Timothy    | -             | S (w)*       |
| 4   | Rush       | Timothy       | EL (w)       | 29  | Timothy    | -             | EL (w)       |
| 5   | Timothy    | -             | EL (w)       | 30  | Timothy    | -             | EL           |
| 6   | -          | -             | EL (w)       | 31  | Timothy    | -             | EL           |
| 7   | Timothy    | -             | EL (w)       | 32  | Timothy    | -             | EL (w)       |
| 8   | Timothy    | -             | EL (w)       | 33  | Rush       | -             | S            |
| 9   | Timothy    | -             | EL (w)       | 34  | -          | -             | EL           |
| 10  | Timothy    | -             | EL (w)*      | 35  | Rush       | -             | EL           |
| 11  | -          | -             | EL (w)*      | 36  | -          | -             | EL           |
| 12  | Timothy    | -             | EL (w)*      | 37  | Timothy    | -             | EL           |
| 13  | Rush       | -             | S (w)*       | 38  | Timothy    | -             | EL           |
| 14  | -          | -             | EL (w)       | 39  | -          | -             | S            |
| 15  | -          | -             | S (w)*       | 40  | -          | -             | EL           |
| 16  | -          | -             | EL (w)*      | 41  | -          | -             | S            |
| 17  | -          | -             | EL (w)*      | 42  | Timothy    | L             | EL           |
| 18  | -          | -             | EL (w)*      | 43  | -          | -             | EL           |
| 19  | Timothy    | -             | EL (w)       | 44  | -          | -             | EL           |
| 20  | Timothy    | -             | EL (w)*      | 45  | Rush       | -             | EL           |
| 21  | Rush       | -             | EL (w)*      | 46  | -          | -             | EL           |
| 22  | Timothy    | Rush          | EL (w)*      | 47  | Timothy    | L             | EL           |
| 23  | Timothy    | -             | EL (w)*      | 48  | Timothy    | -             | EL           |
| 24  | Rush       | Timothy       | EL (w)*      | 49  | Timothy    | -             | S            |
| 25  | -          | -             | EL (w)*      | 50  | -          | -             | EL*          |

**Notes:**

% Vegetation Cover (top canopy intercepts) = 66%

% Bare Ground\*\* = 6%

\*\* - Bare ground occurs only when canopy layers are empty and Soil Surface = S.

Minor white crust observed along transect and in surrounding area.

Vegetation along the transect was consistent with seasonal and surrounding conditions.

L - Litter

EL - Embedded Litter

S - Soil

w - soil surface saturated with water

\* - indicates areas impacted by tire tracks

**Line-Point Intercept Data Form**  
**Transect T2**  
**Tiffany Gathering**  
**BP America Production Company**

**Project:** Tiffany Gathering  
**Transect:** T2  
**Direction:** 340°/346°  
**Date:** 5/21/2020

**Observer:** EM  
**Recorder:** KGS  
**Transect Length:** 100ft  
**Spacing Interval:** 2ft

| Pt. | Top Canopy     | Canopy Layers | Canopy Layers | Soil Surface | Pt. | Top Canopy     | Canopy Layers         | Canopy Layers | Soil Surface |
|-----|----------------|---------------|---------------|--------------|-----|----------------|-----------------------|---------------|--------------|
| 1   | -              | L             | -             | EL           | 26  | -              | -                     | -             | W            |
| 2   | -              | L             | -             | EL           | 27  | Cattail (dead) | -                     | -             | W            |
| 3   | Cattail (dead) | -             | -             | W            | 28  | Cattail (dead) | L                     | -             | W            |
| 4   | -              | -             | -             | W            | 29  | Cattail (dead) | -                     | -             | W            |
| 5   | Cattail        | -             | -             | W            | 30  | Cattail (dead) | Cattail               | -             | W            |
| 6   | -              | L             | -             | W            | 31  | Cattail (dead) | Canada thistle (dead) | L             | W            |
| 7   | -              | -             | -             | W            | 32  | Cattail (dead) | Canada thistle (dead) | L             | W            |
| 8   | -              | -             | -             | W            | 33  | Cattail (dead) | Canada thistle (dead) | L             | W            |
| 9   | -              | L             | -             | W            | 34  | Cattail (dead) | Canada thistle (dead) | L             | W            |
| 10  | Cattail        | -             | -             | W            | 35  | Cattail (dead) | L                     | -             | W            |
| 11  | Cattail        | L             | -             | W            | 36  | Cattail (dead) | L                     | -             | W            |
| 12  | Cattail        | L             | -             | W            | 37  | Cattail (dead) | L                     | -             | W            |
| 13  | Cattail        | -             | -             | W            | 38  | Cattail (dead) | L                     | -             | W            |
| 14  | Cattail (dead) | -             | -             | W            | 39  | Cattail (dead) | Canada thistle (dead) | Cattail       | W            |
| 15  | -              | L             | -             | W            | 40  | -              | L                     | -             | W            |
| 16  | Cattail (dead) | Cattail       | L             | W            | 41  | Cattail (dead) | L                     | -             | W            |
| 17  | -              | L             | -             | W            | 42  | Cattail (dead) | Cattail               | -             | W            |
| 18  | -              | L             | -             | W            | 43  | Cattail (dead) | L                     | -             | W            |
| 19  | Cattail        | L             | -             | W            | 44  | Cattail (dead) | Cattail               | -             | W            |
| 20  | -              | L             | -             | W            | 45  | Cattail (dead) | -                     | -             | W            |
| 21  | -              | L             | -             | W            | 46  | -              | -                     | -             | W            |
| 22  | Cattail (dead) | -             | -             | W            | 47  | Cattail (dead) | -                     | -             | W            |
| 23  | -              | L             | -             | W            | 48  | Cattail (dead) | Cattail               | -             | W            |
| 24  | -              | -             | -             | W            | 49  | Cattail (dead) | Cattail               | -             | W            |
| 25  | Cattail        | -             | -             | W            | 50  | Cattail (dead) | -                     | -             | W            |

**Notes:**

% Vegetation Cover (top canopy intercepts) = 66%

% Bare Ground\* = 0%

\* - Bare ground occurs only when canopy layers are empty and Soil Surface = S.

Vegetation along the transect was consistent with seasonal and surrounding conditions.

Dead foliage is likely from previous growing seasons.

L - Litter

EL - Embedded Litter

W - Water

**Species Table**  
**Tiffany Gathering**  
**BP America Production Company**

| <b>Scientific Name</b> | <b>Common Name</b> | <b>Life Form</b> |
|------------------------|--------------------|------------------|
| <i>Phleum pratense</i> | Timothy            | Grass            |
| <i>Juncus sp.</i>      | Rush               | Grass-like       |
| <i>Typha latifolia</i> | Cattail            | Grass-like       |
| <i>Cirsium arvense</i> | Canada thistle     | Forb             |