

ITEM # 4



**AMENDMENT # 1 TO AGREEMENT**  
**Little Blue NRD and Lower Big Blue NRD**  
**Hazard Mitigation Plan**  
**JEO PROJECT NO. 181464.00**

**November 2018**

**REFERENCE:** Standard form of agreement between Owner and Engineer for professional services dated September 18, 2018. Except as noted below, all other terms and conditions remain unchanged.

**AMENDMENT:** The additional and revised scope of services described below will be performed for this project.

**ADDITIONAL TASK DESCRIPTIONS:**

**Task 6: Dam Inundation Mapping**

**Task 6.1 Dam Inundation Mapping**

Dam Breach Mapping is used to help delineate the area potentially impacted by inundation should a dam fail and can be used to aid in dam hazard classification. JEO will develop breach maps for up to 56 dams within the planning area. These breach maps will be used to inform the dam failure risk assessment.

For the purposes of this project, calculation of peak breach discharges will be developed using the methods outlined in NRCS TR-60 Earth Dams and Reservoirs, using existing geometry obtained from as-built information. Breach propagation will be modeled using two-dimensional analysis in HEC RAS 5.0, using the most recently available LiDAR elevation data. Impacts to downstream structures will be assessed through the use of aerial photography and ArcGIS based analysis, until the breach inundation extents are fully contained within FEMA's regulatory 100-year floodplain.

For each dam assessed as part of this project, a breach map will be developed which includes the following information:

- Breach Inundation Extents
- Estimated Maximum Inundation Depth
- Impacted Structures (If Any)
- Upstream and Downstream Boundary Conditions (Peak Flow, and Normal Depth respectively)
- Regulatory Floodplain Extents from DFIRM database (if available)

**SERVICES NOT INCLUDED (If desired, a fee for these services can be negotiated):**

Specific items not included in this amendment are:

- Field survey or site visits of existing dams

2018-12-11

### **ASSUMPTIONS**

It is assumed that as-built information is available for the dams mentioned above. If as-built information is not available or is inadequate, JEO will update the NRD and discuss how to proceed.

### **ANTICIPATED SCHEDULE:**

Notice to Proceed ..... August 2019\*  
Final Inundation Maps..... December 2020

\*Following award of PDM grant

### **AMENDED PROJECT FEE\*:**

Task 6: Dam Inundation Mapping ..... \$112,000.00  
**Total Amendment Fee: ..... \$112,000.00**

Original Contract Fee ..... \$150,000.00  
Amendment #1 Fee ..... \$112,000.00  
**Total Revised Contract:..... \$262,000.00**

\*If schedule delays beyond JEO's control occur, a contract revision may be required to account for additional services and outstanding tasks after January 2021.

The Additional Services stated above will be billed hourly, not to exceed the above estimated fee. Owner will be billed monthly for services to date. Invoices are due upon receipt. JEO will provide additional services at your request according to the applicable general hourly rates.

**OWNER: Little Blue Natural Resources District**

\_\_\_\_\_  
**By: Michael D. Onnen, Manager**

**Date:** \_\_\_\_\_

**ENGINEER: JEO Consulting Group, Inc.**

  
\_\_\_\_\_  
**By: Kevin Kruse, Senior Project Manager, Water Resources**

**Date:** 11.21.2019



ITEM # 4

October 10, 2018

**BX**  
Proposed

Accepted BY

## Date Breach



### 32-MILE CREEK WATERSHED - ADAMS COUNTY

Year Built	Dam Name & County		Location	Acres		Surface Acres	Ac Ft Flood Storage		Purpose	Date Breach	
	Year Built	County		Drainage	Acres		Storage	Acres		Route Complete	Breach Route Conducted By
1967	C-Adams	SE 1/4 15-7-11	1,280	22.7	225.7	Flood, Erosion					
1968	D-Adams	SE 1/4 29-7-11	6,860	65.8	1,764.10	Flood, Erosion					
1968	E-Adams	SE 1/4 32-7-11	1,470	44.8	523.7	Flood, Erosion					
1976	H-Adams	SW 1/4 NE 1/4 31-7-10	9,978.00	64.9	3,074.40	Water, Flood, Rec.					
1976	J-Adams	NE 1/4 SE 1/4 29-7-10	4,340.00	83.8	1,047.10	Water, Flood, Rec.					
1968	K-Adams	SE 1/4 NW 1/4 31-8-11	5,907	92.9	1,705.60	Flood, Erosion				July-07	NRCS
1970	K-Dike-Adams	26, 27, 28 -T8N-R12W	4,180		1,372.00	Flood Protection					
			34015.0	374.9	9712.6						

### BIG SANDY CREEK WATERSHED

Year Built	Dam Name & County		Location	Acres		Surface Acres	Ac Ft Flood Storage		Purpose	Date Breach	
	Year Built	County		Drainage	Acres		Storage	Acres		Route Complete	Breach Route Conducted By
1982	MARC-Clay	SE 1/4 20-6-7	27,008	228	6,890.00	Flood Cont. Recharge				July-11	USACE
	Bruning Dam,										
1984	Fillmore	SE 1/4 35-5-2	15,936	258.6	6,706.40	Flood Cont. Recharge				April-16	JEO Consulting
			42944.0	486.6	13596.4						

### LITTLE SANDY CREEK, FILLMORE, JEFFERSON, SALINE, THAYER COUNTIES

Year Built	Dam Name & County		Location	Acres		Surface Acres	Ac Ft Flood Storage		Purpose	Date Breach	
	Year Built	County		Drainage	Acres		Storage	Acres		Route Complete	Breach Route Conducted By
2003	30 - Thayer	NW 13-4-1W	826	12.09	140.76	Flood Control, Recharge					
2008	40 - Thayer	SE 2-4-1W	14,528	146.36	3,141.50	Flood Control, Recharge				April-16	JEO Consulting
2006	61 - Fillmore	SW 12-5-1W	5,536	74.83	1,341.95	Flood Control, Recreation					
2012	73 - Saline	SE 6-5-1E	3,994	56.43	858.21	Flood Control					
			24,884.0	289.7	5,482.4						