

# Appendix T

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INTERA Scope of Work to Support Subsidence Mitigation Cost Analysis for the Friant-Kern Canal

**COST SHARING AGREEMENT FOR ADDITIONAL DATA COLLECTION AND  
MODELING TO SUPPORT SUBSIDENCE MITIGATION COST ANALYSIS FOR THE  
FRIANT KERN CANAL**

This Cost Sharing Agreement ("Agreement") is entered into on **April 1, 2024**, by and among the following Groundwater Sustainability Agencies ("GSAs"), Districts, or Agencies located within the Kern County Groundwater Subbasin, each a "Party" and collectively referred to as the "Parties":

1. Cawelo Water District
2. North Kern Water Storage District
3. Shafter-Wasco Irrigation District
4. Shafter-Wasco Irrigation District 7th Standard Annex
5. Southern San Joaquin Municipal Utility District
6. Arvin-Edison Water Storage District
7. Buena Vista Water Storage District
8. City of Bakersfield
9. Eastside Water Management Area
10. Improvement District No. 4
11. Kern Delta Water District
12. Kern Water Bank GSA
13. Kern-Tulare Water District
14. Pioneer GSA
15. Rosedale-Rio Bravo Water Storage District
16. Semitropic Water Storage District
17. Tejon-Castac Water District
18. West Kern Water District
19. Wheeler Ridge-Maricopa Water Storage District

**RECITALS:**

WHEREAS, the Parties collectively have a shared interest in developing a model to preliminarily evaluate potential impacts of future groundwater levels and subsidence along the Friant-Kern Canal (FKC) and preliminarily attribute those impacts to Kern Subbasin groundwater management activity for support of potential FKC mitigation and coordinated Groundwater Sustainability Plans (GSPs) to satisfy the requirements of the Sustainable Groundwater Management Act;

WHEREAS, Parties will engage the services of Intera Incorporated (Consultant) to develop the model;

WHEREAS, the cost of Consultant services to develop the model will not exceed \$120,000 based on the proposed tasks and cost estimate provided by Consultant dated February 22, 2024 (Proposal) and is attached hereto as Exhibit A;

WHEREAS, the Parties acknowledge that sharing the costs associated with the model development is beneficial and cost-effective;

WHEREAS, the Parties wish to appoint North Kern Water Storage District (NKWSD) as the lead authority and signatory to the Consultant contract for services described in the Proposal and to provide payment for such services on behalf of the Parties to this Agreement;

NOW, THEREFORE, in consideration of the mutual covenants contained herein, the Parties agree as follows:

**AGREEMENT TERMS:**

**1. Cost Sharing:** The Parties agree to collectively share the total cost of up to \$120,000 for Tasks 1 through 5 as presented in the Proposal, with each Party contributing a share of the total cost as described in Exhibit B. If total final costs are less than \$120,000 then each Party will pay their proportionate share.

**2. Payment to NKWSD:** NKWSD shall invoice the Parties as needed for their respective proportionate cost share in Exhibit B. However, upon completion of the Proposal, NKWSD may also elect to provide a one-time invoice for a Party's total cost share in Exhibit B. Parties only agree to provide payment for services described in the Proposal. Upon receiving an invoice, the Parties agree to provide payment within 45 days.

**3. Accounting:** NKWSD shall maintain accurate accounting records and other documentation pertaining to all invoices and payments per this Agreement and Consultant contract. Supporting documentation will be provided with invoices for Party's review.

**5. Amendments:** This Agreement may only be amended in writing and mutually agreed to by all Parties hereto.

**6. Governing Law:** This Agreement shall be governed by and construed in accordance with the laws of the State of California.

**7. Joint Ownership of Work Product:** All work product generated pursuant to this Agreement shall be jointly owned by the Parties so that each will have access and ability to review and comment on drafts and otherwise utilize said work product. The work product generated pursuant to this Agreement shall not be binding on any Party.

**8. Execution in Parts or Counterparts:** This Agreement shall be executed in parts or counterparts, each part or counterpart being an exact duplicate of all other parts or counterparts, and all parts or counterparts shall be considered as constituting one complete original and may be attached together when executed by the Parties hereto. Electronic signatures shall be binding.

**EXECUTION:**

IN WITNESS WHEREOF, the Parties hereto have executed this Cost Sharing Agreement as of the date written above:

1. Cawelo Water District

DocuSigned by:  
*David Halopoff*  
AADF128G7D204F5...

2. North Kern Water Storage District

DocuSigned by:  
*[Signature]*  
D4CE6B513ACB4B7...

3. Shafter-Wasco Irrigation District

DocuSigned by:  
*Kris Lawrence*  
C6424311CE0E418...

4. Shafter-Wasco Irrigation District 7th Standard Annex

DocuSigned by:  
*Kris Lawrence*  
C5424311CE0E418...

5. Southern San Joaquin Municipal Utility District

DocuSigned by:  
*Roland Gross*  
GD47AC533A5B40B...

6. Arvin-Edison Water Storage District

DocuSigned by:  
*[Signature]*  
EBB22BEA39FC497...

7. Buena Vista Water Storage District

DocuSigned by:  
*Tim Ashlock*  
341D61C8B51642C...

8. City of Bakersfield

DocuSigned by:  
*Kristina Budak*  
851D96B36CEE4CA...

9. Eastside Water Management Area

DocuSigned by:  
*Chad Hathaway*  
650F9CA617E54A3...

10. Improvement District No. 4

DocuSigned by:  
*TORTEL*  
61784EAE45FA4B7...

11. Kern Delta Water District

DocuSigned by:  
*[Signature]*  
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12. Kern-Tulare Water District

DocuSigned by:  
*[Signature]*  
A98E2F5BB6E84BD...

13. Kern Water Bank GSA

DocuSigned by:  
*Jonathan Parker*  
DB23EAE1F6E14B4...

14. Pioneer Groundwater Sustainability Agency

DocuSigned by:

*Lauren Bauer*

95F5FDD4863A4D8...

15. Rosedale Rio-Bravo Water Storage District

DocuSigned by:

*Dan Bartel*

0AFA98D07C50427...

16. Semitropic Water Storage District

DocuSigned by:

*Jason Gianguinto*

F02BDC8FFAD3431...

17. Tejon-Castac Water District

DocuSigned by:

*Angelica Martin*

FB7E46CF267E471...

18. West Kern Water District

DocuSigned by:

*Greg Hammett*

EEAA5AEC18784B5...

19. Wheeler Ridge-Maricopa Water Storage District

DocuSigned by:

*Paul J. Nichols*

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EXHIBIT A

PROPOSAL FOR ADDITIONAL DATA COLLECTION AND MODELING TO SUPPORT  
SUBSIDENCE MITIGATION COST ANALYSIS FOR THE FRIANT KERN CANAL



## **Proposal for Additional Data Collection and Modeling to Support Subsidence Mitigation Cost Analysis for the Friant Kern Canal**

Additional data-collection, analysis, and modeling is necessary to evaluate future impacts on water levels and subsidence along the Friant Kern Canal (FKC) from groundwater pumping in different GSAs within the Kern Subbasin. This data collection and analysis was not included in the original scope and budget to support GSP revisions, as the previous sustainable management criteria for the FKC had not accounted for conveyance loss from future subsidence. Any unmitigated conveyance loss due to subsidence along the FKC has been deemed an “undesirable result” under SGMA by the Friant Water Authority (FWA). Hence, mitigation alternatives to raise the liner (and associated infrastructure) along the sagging sections of the canal are being evaluated currently. A cost-sharing framework is being developed to fund these future mitigation efforts. The cost-sharing framework will entail attributing costs based on future impacts on water levels and subsidence along sagging sections of the FKC from groundwater pumping in different GSAs. This proposal outlines the approach and cost involved with the data-collection, analysis, and modeling for this effort.

### **Task 1. Recover and survey elevations at selected benchmarks**

Perform GPS RTK survey methods at eight benchmark sites near the FKC to obtain ellipsoid and orthometric elevations processed through NOAA's Online Positioning User Service (OPUS). For benchmarks located in areas where direct GPS observations are not possible, a nearby reference mark will be established, and conventional leveling will be used to determine the elevation of the benchmark.

**Estimated Cost: \$12,000**

### **Task 2. Analyze and prepare long-term groundwater level and subsidence time series data and figures**

Evaluate water-level data from the current period and historical water-level data near the FKC to provide a time series of data for the 1D model (Task 3) and to determine the pre-consolidation head and current critical head at eight selected locations of geodetic control (benchmarks). A time series of leveling data from benchmarks monumented by the National Geodetic Survey, U.S. Geological Survey, U.S. Bureau of Reclamation, and California Department of Transportation will be constructed from blue-booked leveled elevations and recoveries. Data compiled from the CASGEM, DWR water data library, and USGS will be used near the benchmark sites to construct a time series of water level data at various depth intervals. Approximately 75% of this data has already been collected as part of the development of the subsidence sustainable management criteria (SMCs). The cost below is for *additional* data collection and analysis to support the 1D modeling under Task 3.

**Estimated Cost: \$10,000**

### **Task 3. Subsidence analysis using the Stanford 1D model**

Use the Stanford 1D model to forecast subsidence through 2040 or other desired planning timeframe to connect water levels and subsidence along the Friant Kern Canal (FKC). The model will be calibrated to the long-term subsidence and groundwater level data from Task 2. Well-log data will be compiled for each of the 8 sites to estimate the number and thickness of clay interbeds.

**Estimated Cost: \$35,000**

#### **Task 4. Updated model analysis of water level changes by GSA**

Use updated IWFM-Kern model (currently being updated by Todd Groundwater to support the GSP revisions) to evaluate change in groundwater levels through 2040 or other desired planning timeframes to simulate future change in water levels under a range of different scenarios with GSAs within the Kern subbasin pumping at different rates to assess impacts on future water levels along the Friant Kern Canal. INTERA will work with Todd Groundwater to perform the water level scenarios. Water level results from the scenarios will be linked to the 1D subsidence model (Task 3) to translate water level impacts to subsidence impacts along the FKC. The 1D subsidence model is necessary since the IWFM-Kern model has not been calibrated to subsidence. This task assumes multiple iterations to support the determination of potential attribution of water level and subsidence impacts along the FKC. Relative contribution to future water level declines and subsidence along the most vulnerable reaches of the FKC would be the basis for the cost-sharing framework between the GSAs determined to be contributing to water level declines and subsidence along the FKC.

**Estimated Cost: \$60,000**

#### **Task 5. Meetings and Presentations**

Results from the evaluation will be presented to the Kern Subbasin subsidence sub-committee, GSA managers, and coordination committee. The analysis will also be presented to the Friant Water Authority to get their buy-in on the approach and results. The analysis will be documented in a technical memorandum that may be used as an attachment to the Kern Subbasin revised GSP to document the FKC mitigation alternative.

**Estimated Cost: \$3,000**

#### **Total Cost and Schedule**

The total cost for the scope above is estimated to be **\$120,000**. Tasks 1-3 can be completed within 3 months of notice to proceed. Task 4 and 5 will require 3 additional months (including the time for presentation at various committee meetings) from receiving revised IWFM-Kern model files from Todd Groundwater. It is anticipated that the IWFM-Kern model will be ready for the modeling analysis by the late summer (August, 2024) timeframe.



EXHIBIT B

COST SHARING AGREEMENT TABLE:  
 ADDITIONAL DATA COLLECTION AND MODELING TO SUPPORT SUBSIDENCE MITIGATION COST  
 ANALYSIS FOR THE FRIANT-KERN CANAL

	Participation	Agency	Cost Share Amount	Cost Share %
1	Yes	Cawelo Water District	\$7,968.22	6.6%
2	Yes	North Kern Water Storage District	\$7,968.22	6.6%
3	Yes	Shafter-Wasco Irrigation District	\$7,968.22	6.6%
4	Yes	Shafter-Wasco Irrigation District 7th Standard Annex	\$7,968.22	6.6%
5	Yes	Southern San Joaquin Municipal Utility District	\$7,968.22	6.6%
6	Yes	Arvin-Edison Water Storage District	\$7,968.22	6.6%
7	Yes	Kern-Tulare Water District	\$7,968.22	6.6%
8	Yes	Pioneer Groundwater Sustainability Agency	\$6,315.79	5.3%
9	Yes	Semitropic Water Storage District	\$6,315.79	5.3%
10	Yes	Buena Vista Water Storage District	\$5,454.55	4.5%
11	Yes	City of Bakersfield	\$5,454.55	4.5%
12	Yes	Eastside Water Management Area	\$5,454.55	4.5%
13	Yes	Improvement District No. 4	\$5,454.55	4.5%
14	Yes	Kern Delta Water District	\$5,454.55	4.5%
15	Yes	Kern Water Bank Authority	\$5,454.55	4.5%
16	Yes	Rosedale-Rio Bravo Water Storage District	\$5,454.55	4.5%
17	Yes	Tejon-Castac Water District	\$5,454.55	4.5%
18	Yes	Wheeler Ridge-Maricopa Water Storage District	\$5,454.55	4.5%
19	Yes	West Kern Water District	\$2,500.00	2.1%
20	No	Westside District Water Authority	\$0	0.0%
21	No	Olcese Water District	\$0	0.0%
22	No	Henry Miller Water District	\$0	0.0%
Total			\$120,000	100.0%