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Submitted to:

Colorado Water Conservation Board

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Scope of Work for:

# **Drought Tournament/Gaming Activity & Exercise**

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## Introduction

The Colorado Water Conservation Board (CWCB) and National Integrated Drought Information System (NIDIS) are hosting a Drought Tournament the day before the State Drought Conference in September 2012. The emphasis will be on introducing the concept of drought 'gaming' to a representative assemblage from various sectors of the Colorado water resources community. The intent of the tournament will be to gain the community's attention and feedback regarding the use of drought tournaments as an innovative tool to address drought related problems, permit collaborative solutions, and to harvest critical information on drought impacts. The prologue will provide a foundation for an exciting new approach to drought planning

Objectives of this drought tournament include the following:

- Educate tournament participants on the multidisciplinary and multi-sector implications of drought through an engaging, competitive and fun environment.
- Encourage collaboration among representatives of various backgrounds and sectors.
- Provide a forum to develop contacts and information useful for future local, regional and statewide drought planning purposes.
- Introduce the concept of the "gaming forum" as a tool to engage stakeholders, develop relationships and collect information for future planning purposes.

The tournament will consist of three or four rounds where each round will entail an annual drought scenario applied to a pre-designed fictitious watershed. A round will consist of the following activities:

- The tournament facilitator will present the conditions specific to the drought scenario.
- Teams will be charged with developing a portfolio of mitigation and drought response strategies that best address possible drought impacts during the irrigation season. Teams will also be encouraged to consider long-term impacts and strategies as a result of potential consecutive-year droughts.
- The portfolios will be developed using a pre-designed list of mitigation and response strategies. Teams may have the option of developing additional innovative strategies not included on the list.
- Teams will be required to operate within a fixed monetary budget.
- At the conclusion of each round, the facilitator will describe the conditions of the basin assuming no mitigation and response strategies were implemented.
- "Team captains" will then have the opportunity to present their teams' portfolios and advocate how their portfolio best addresses the drought based on what they knew at the beginning of the round.
- Following the team presentations, the referees will use a pre-designed scoring system and "expert judgment" to determine how well each team sufficiently mitigated and responded to the drought. This evaluation will include how well each team addressed the multiple sectors in the State by considering social, economic and environmental factors.
- A running tally of the teams' scores will be maintained and presented in a fun competitive manner. There will be a prize for the winning team at the end of the tournament.

This scope of work outlines the approach to complete the project and proposes a project cost estimate and preliminary schedule.

## Approach

Our proposed approach is divided into five project tasks. Task 1 encompasses the selection of

tournament participants and development of draft gaming materials for review and discussion purposes. Task 2 focuses on the testing of the tournament and refinement of the gaming materials and scoring protocol in preparation for the day of the tournament. Task 3 includes the facilitation and organizational activities necessary to host the Drought Tournament while Task 4 focuses on obtaining and recording tournament feedback. Administration activities necessary to manage the financials of the project are included in Task 5.

## **Task 1: Development of the Drought Tournament**

### *1.1 Participant Selection and Invitations*

The Drought Tournament will involve an estimated 55 tournament participants. These participants will include the following:

- CWCB/NIDIS – These agencies are funding and leading the development of the Drought Tournament.
- Expert Panel – A combination of four or five water and drought experts will be selected to serve on an “Expert Panel.” This Expert Panel will function as the referees during the tournament, which will be responsible for the scoring and answering questions as the teams are developing mitigation and drought response portfolios. The Expert Panel may include representatives from Colorado State University, AMEC, NDMC, NIDIS and Agriculture & Agri-Food Canada.
- AMEC - Hired Contractor to develop, organize and facilitate the Drought Tournament. We will be receiving feedback from CWCB/NIDIS and the Expert Panel throughout the process.
- Tournament players – The tournament will consist of thirty players, five teams of six players. Each team will be socially engineered to be geographically diverse and represent multiple sectors including recreation and tourism, energy, municipal providers, environment, agriculture, etc.
- Fans – Up to ten “fans” may be invited to the tournament to observe and comment on the activity. The fans may consist of out of State water and drought related stakeholders, CWCB/NIDIS staff, academia and others in the private or public sector with an interest in observing the game. The fans will be selected by the Expert Panel, AMEC and CWCB/NIDIS.

AMEC will develop a draft invitation letter to the tournament players and fans while CWCB will facilitate the invitation and RSVP process.

### *1.2 Development of Pre-Tournament Materials*

A summary of the tournament rules and description of the fictitious watershed will be distributed to the tournament players and fans a week in advance of the tournament. These materials will be completed at a 60% draft level (for Task 1.2) focusing on the major concepts for review and feedback by the Expert Panel and CWCB/NIDIS. The drafts will be finalized for distribution to the tournament players and fans in Task 2.

- Summary of the tournament rules – Brief explanation of the tournament “basics,” objectives and rules
- Description of the fictitious watershed – The watershed will be politically and geographically neutral in order to avoid common geographic and political water related positions (i.e. east slope vs west slope), and encourage an open innovative discussion. This description will contain maps of the watershed and information/supporting graphics on the water supply, water users, economic sectors, and average climate and environmental conditions. The fictitious watershed AMEC developed for the CWCB Municipal Sample Drought Plan may be used as a starting point.
- Roster listing the teams, referees and fans

We will also develop a draft power point presentation introducing the gaming concept and rules of the tournament. This presentation will be given at the beginning of the testing simulation, revised accordingly and then the finalized version will be used to introduce the tournament on the day of the event.

### 1.3 *Drought Scenarios with Applied Paleo and Historic Hydrology*

We will develop three to four rounds of the tournament. Each round will consist of drought scenario applied to the fictitious watershed. We will develop the drought scenarios (e.g. D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub>, D<sub>4</sub>) to be representative of realistic drought conditions in Colorado based on State historic and paleohydrology data. Various components of the U.S. Drought Monitor (i.e. streamflow, percent of normal precipitation, etc) will be included. Three drought scenarios will be developed for Task 1 in preparation for the Task 2 simulation. Following the simulation, we will develop a fourth scenario if CWCB/NIDIS and the Expert Panel agrees that an additional scenario is necessary.

### 1.4 *Preliminary Lists of Mitigation and Response Strategies*

We will develop three preliminary lists of mitigation and response strategies corresponding to each drought scenario. These strategies will address potential drought impacts applicable to the diverse sectors in Colorado. We will also develop a preliminary scoring framework for discussion purposes during the first meeting. This framework will be further refined in Tasks 2.2. and 2.3 prior to Simulation Day.

### 1.5 *Meeting #1: Review of Materials (60% Complete)*

The focus of Meeting #1 is to introduce the concept of the tournament and basic rules to the Expert Panel and discuss the draft materials outlined above. CWCB and the Expert Panel will also have the opportunity to discuss the invitee selection list and composition of the teams.

## **Task 1 Assumptions**

- AMEC will be responsible for scheduling, facilitating and hosting Meeting #1 with CWCB/NIDIS and the Expert Panel.
- CWCB will develop the initial and final tournament player and fan invitee lists. AMEC and the Expert Panel will review and provide input.
- CWCB will work closely with AMEC and the Expert Panel in grouping the tournament players into teams that sufficiently represent multiple sectors.
- CWCB will be responsible for finalizing and distributing the invitations as well as tracking RSVPs and answering basic questions from invitees on the event logistics.
- CWCB will be responsible for the development of the draft roster

## **Task 1 AMEC Deliverables**

- Draft invitation for the tournament players and draft invitation for the fans
- One to two page summary of the tournament rules (Draft 1)
- Description of the fictitious basin including supporting graphics (Draft 1)
- Three drought scenarios (Draft 1)
- Draft powerpoint presentation presenting the rules of the tournament (Draft 1)
- Preliminary list of mitigation and response strategies (Draft 1)
- Preliminary scoring framework for discussion purposes

## **Task 2: Refinement of Gaming Materials, Scoring and Testing Simulation**

### *2.1 Refinement of Gaming Materials for Testing*

At the conclusion of Meeting #1, CWCB/NIDIS and the Expert Panel will comment on the draft gaming materials developed in Task 1. We will incorporate the feedback and test these updated draft materials on Simulation Day.

### *2.2 Preliminary Scoring of Drought Response and Mitigation Strategies*

We will develop a preliminary means to score the drought and response mitigation strategies. This process could involve each team using a laptop to record their portfolios. The approach will be tested and refined on Simulation Day.

### *2.3 Scoring Tool*

An excel spreadsheet will be developed to assist with and record the teams' scores at the conclusion of each round. The spreadsheet will keep a running tally of the teams' scores throughout the tournament. This spreadsheet will be tested during the simulation and updated accordingly.

### *2.4 Meeting #2: Testing Simulation Day*

This exercise is anticipated to take six hours including time for discussion and feedback focusing on what is working well and what improvements can be made. During the simulation, the Expert Panel will serve as the "players." Two rounds of the tournament will be played using the pre-designed drought scenarios. AMEC will serve as the game facilitator and referee role while CWCB/NIDIS will have the opportunity to observe as fans and comment at the conclusion of each round.

### *2.5 Post Simulation Day - Refinement of Gaming Materials and Scoring*

The final drafts of the gaming materials will be updated according to the feedback received from the testing simulation. If necessary, the scoring will be redistributed to the Expert Panel and CWCB/NIDIS for comment and final review.

### *2.6 Scoring Review*

The scoring will be updated according to the feedback received from the final scoring review by the Expert Panel and CWCB/NIDIS.

## **Task 2 Assumptions**

- AMEC will be responsible for scheduling, facilitating and hosting the Simulation Day.
- AMEC will be responsible for collecting up to seven sets of comments during each review period. This includes a single set of comments from NIDIS, CWCB and from each of the Expert Panel members (4 or 5 members). Where applicable, comments will be provided in track changes.

## **Task 2 AMEC Deliverables**

- Gaming materials and scoring to be tested on Simulation Day
  - Draft pre-tournament materials itemized in Task 1.2 (Draft 2)
  - Draft powerpoint presentation presenting the rules of the tournament (Draft 2)
  - Draft list of mitigation and response strategies (Draft 2)
  - Preliminary scoring tool
  - Preliminary scoring (Draft 1)
- Post Simulation Day
  - Final pre-tournament materials itemized in Task 1.2

- Final powerpoint presentation presenting the rules of the tournament
- Final list of mitigation and response strategies
- Final version of scoring tool
- Draft Scoring (Draft 2)
- Post Scoring Review
  - Final Scoring

### **Task 3: Day of Tournament – Facilitation and Organization**

#### *3.1 Coordination of Facility/Hosting Logistics*

AMEC will coordinate with the facility on the logistics necessary to host the event. This includes room set-up, catering of food and beverages, lighting, AV logistics, etc.

#### *3.2 Tournament Facilitation and Gaming Materials and Equipment*

AMEC will facilitate and coordinate all gaming-related activities necessary for the Drought Tournament. Activities will include a greeting/sign in, introductions, coordination with facility/catering the day of the event, organizing the players into their teams and informing all participants of their roles, setting expectations for the day, allotting time for networking, lunch, etc. We will also facilitate a debrief with all participants at the conclusion of the event discussing what worked and improvements could be made. This period will also provide the opportunity for participants to fill out the survey described in Task 4.

Jeff Brislawn will serve as the lead facilitator while Courtney Pepler will provide assistance with facilitation, coordinate all of the daily activities necessary for the event and record the teams' presentations on their mitigation and drought response portfolios. Graeme Aggett will provide assistance with the coordination, observation of the event dynamics and recording. Lee Rozaklis will serve as a referee.

AMEC will also prepare the gaming materials listed in Task 2 necessary for playing the game. This will be a combination of powerpoint presentations (i.e. a presentation introducing a drought scenario at the beginning of a round) and handouts. Each participant will receive a notebook to organize the handouts. AMEC will also provide additional gaming "equipment" such as referee shirts, name tags, a sign-in sheet, team labels, etc.

### **Task 3 Assumptions**

- CWCB will prepare the roster
- AMEC will be responsible for supplying all gaming materials and equipment for the tournament
- CWCB will distribute all applicable gaming materials/pre-tournament materials to the players and fans in advance of the tournament
- Food and beverage catering is anticipated to cost \$2,000.
- Gaming materials (notebooks and handouts) and gaming equipment is anticipated to cost \$2,000.
- CWCB will be responsible for obtaining a prize(s) for the winning team.

### **Task 3 AMEC Deliverables**

- Draft and final agenda for the day of the tournament
- Final pre-tournament materials itemized in Task 1.2
- Gaming notebooks and handouts that contain the applicable final drafts of the Task 2 deliverables
- Gaming equipment necessary for the tournament

- Final powerpoint presentations presenting the rules of the game and supporting information on the drought scenarios.
- Scoring tool (including scores) necessary to operate the game.

## **Task 4: Tournament Follow Up**

### *4.1 Participant Survey*

We will develop a draft survey to gage how well the Drought Tournament met the objectives stated above and identify what worked and what could be improved upon. All participants will be encouraged to fill out a survey at the conclusion of the event.

### *4.2 Presentation at the State Drought Conference*

A forty-five minute time slot has been allotted to introduce the gaming concept and Drought Tournament at the State Drought Conference in September. We will provide up to a twenty minute presentation on the gaming concept, process involved to develop the tournament, tournament rules and an overview of the tournament outcome. Our presentation will be followed by commentary on the Drought Tournament by other participants and a question and answer session.

### *4.3 Conference Call: Debrief on Tournament*

We will schedule and facilitate a two-hour conference call with CWCB/NIDIS and the Expert Panel to discuss the pros/cons and lessons learned from the tournament. Results of the survey will be provided prior to the call.

### *4.4 Draft and Final Summary Memo*

We will develop up to an eight page draft memo summarizing the objectives of the tournament, how it was developed, basic rules and how it was facilitated, outcomes, pros, cons, lessons learned and future recommendations. Where applicable, this memo will refer to the gaming materials and scoring developed specifically for the event which will be included as an attachment.

## **Task 4 Assumptions**

- CWCB/NIDIS and the Expert Panel will have an opportunity to review and comment on the draft survey and summary memo. All comments will be provided in track changes. As described in Task 3, AMEC will incorporate up to seven sets of comments.
- CWCB/NIDIS will have an opportunity to review and comment on portions of the draft presentation prior to the State Drought Conference.

## **Task 4 AMEC Deliverables**

- Draft survey
- Final survey
- Survey results
- Draft conference presentation
- Final conference presentation
- Draft summary memo
- Final summary memo

## **Task 5: Project Administration**

### *5.1 Monthly Invoices to CWCB*

All invoices and progress reports submitted to CWCB will be compatible with CWCB's accounting and billing requirements.

### *5.2 Monthly Invoices to NIDIS/UCAR*

All invoices and progress reports submitted to NIDIS/UCAR will be compatible with NIDIS/UCAR accounting and billing requirements.

## **Task 5 Assumptions**

- Time budgeted for this task covers the effort necessary to manage two separate contracts and develop monthly progress reports.

## **Task 5 AMEC Deliverables**

- Monthly invoices with brief progress reports summarizing the monthly work performed for each project phase.

## **AMEC Project Team**

The AMEC project team is uniquely qualified to carry out the Drought Tournament. Jeff Brislawn will serve as project manager bringing forth his expertise on the design of natural hazard exercises. He will be responsible for project oversight and communication with CWCB/NIDIS on financial and critical path items. Courtney Pepler will serve as assistant project manager, responsible for the development of draft materials and communication with CWCB/NIDIS on deliverables and organization details related to the day of the tournament. Lee Rozaklis will serve on the Expert Panel as a Colorado water resources expert while Graeme Aggett will provide his expertise on drought risk assessment including drought visualization work he is currently conducting for Agriculture & Agri-Food Canada. Luke Swan whom is also involved with the drought visualization project and Mack Chambers will provide graphic support.

## Schedule

Table 1 provides a preliminary project schedule that provides for the completion of all work within the project timeframe. A more detailed schedule will be developed once the contract has been signed.

Table 1: Schedule

| Drought Tournament/Gaming Activity & Exercise                          |   |   |
|--|---|---|
| Task   | Timeline  | Notes*  |
| Task 1: Development of Drought Tournament                              | Meeting #1 targeted to occur one month from date of contract    | <u>Meeting #1: Review of materials at 60%.</u><br>Target for mid June/early July to allow sufficient time for revisions and Simulation Day.<br>Invitations to participants should be sent early June. |
| Task 2: Refinement of Gaming Materials, Scoring and Testing Simulation | Simulation Day targeted to occur 2 months from date of contract | <u>Meeting #2: Simulation Day</u><br>Targeted for early/mid July to allow sufficient time for development of final materials.   |
| Task 3: Day of Tournament - Facilitation and Organization              | September 18, 2012  |   |
| Task 4: Tournament Follow Up   | September 18 to mid November                                    |   |
| Task 5: Project Administration   | Date of contract to mid November                                |   |

\* Targeted dates assume the contract is final early/mid May.

## Estimated Project Cost

Details on the total project cost estimate of \$68,640 are provided in Table 2. CWCB and NIDIS/UCAR will split the project cost where each will fund \$34,320. It is assumed that CWCB will fund Task 1 and portions of Task 2 and Task 5. NIDIS/UCAR will fund Task 3 and portions of Task 2 and Task 5.

Table 2: Project Cost Estimate

| STAFF POSITION  | Rozaklis Professional Level 25 | Harding Professional Level 25 | Aggett Professional Level 19 | Brislawn Professional Level 18 | Peppler Professional Level 15 | Swan Professional Level 12 | Chambers Technician Level 13 | Pedrick Administrative Level 8 | McAmis Administrative Level 8 | Expenses       | Total           |
|---|--------------------------------|-------------------------------|------------------------------|--------------------------------|-------------------------------|----------------------------|------------------------------|--------------------------------|-------------------------------|----------------|-----------------|
| HOURLY RATE   | \$198                          | \$198                         | \$160                        | \$150                          | \$125                         | \$110                      | \$68                         | \$68                           | \$68                          |                |                 |
| <b>Task 1: Development of the Drought Tournament</b>                          |                                |                               |                              |                                |                               |                            |                              |                                |                               |                |                 |
| Participant Selection and Invitations   | 0                              | 0                             | 0                            | 1                              | 1                             | 0                          | 0                            | 0                              | 0                             | \$0            | \$275           |
| Development of Pre-Tournament Materials                                       |                                |                               |                              |                                |                               |                            |                              |                                |                               |                |                 |
| Tournament Rules Summary Sheet  | 0                              | 0                             | 0                            | 2                              | 4                             | 0                          | 0                            | 0                              | 0                             | \$0            | \$800           |
| Description of Fictitious Watershed   | 1                              | 0                             | 1                            | 2                              | 18                            | 8                          | 6                            | 0                              | 0                             | \$0            | \$4,196         |
| Tournament Rules Power Point  | 1                              | 0                             | 1                            | 2                              | 8                             | 0                          | 0                            | 0                              | 0                             | \$0            | \$1,658         |
| Drought Scenarios   | 3                              | 3                             | 3                            | 3                              | 16                            | 4                          | 0                            | 0                              | 0                             | \$0            | \$4,558         |
| Preliminary Lists of Mitigation and Response Strategies                       | 0                              | 0                             | 0                            | 2                              | 14                            | 0                          | 0                            | 0                              | 0                             | \$0            | \$2,050         |
| Meeting #1: Review of Materials (60% Complete)                                | 5                              | 0                             | 5                            | 5                              | 6                             | 0                          | 0                            | 0                              | 0                             | \$220          | \$3,510         |
| Phase Total   | 10                             | 3                             | 10                           | 17                             | 67                            | 12                         | 6                            | 0                              | 0                             | \$220          | \$17,047        |
| <b>Task 2: Refinement of Gaming Materials, Scoring and Testing Simulation</b> |                                |                               |                              |                                |                               |                            |                              |                                |                               |                |                 |
| Refinement of Gaming Materials for Testing (80% complete)                     | 1                              | 0                             | 1                            | 4                              | 22                            | 2                          | 2                            | 0                              | 0                             | \$0            | \$4,064         |
| Preliminary Scoring of Drought Response and Mitigation Strategies             | 1                              | 0                             | 1                            | 2                              | 16                            | 0                          | 0                            | 0                              | 0                             | \$0            | \$2,658         |
| Scoring Tool  | 3                              | 0                             | 3                            | 2                              | 8                             | 0                          | 0                            | 0                              | 0                             | \$0            | \$2,374         |
| Meeting #2: Testing Simulation Day  | 8                              | 0                             | 8                            | 12                             | 18                            | 0                          | 0                            | 0                              | 0                             | \$0            | \$6,914         |
| Post Simulation Day - Refinement of Gaming Materials and Scoring              | 1                              | 0                             | 1                            | 6                              | 24                            | 2                          | 4                            | 0                              | 0                             | \$0            | \$4,750         |
| Scoring Review  | 0                              | 0                             | 0                            | 2                              | 8                             | 0                          | 0                            | 0                              | 0                             | \$0            | \$1,300         |
| Phase Total   | 14                             | 0                             | 14                           | 28                             | 96                            | 4                          | 6                            | 0                              | 0                             | \$0            | \$22,060        |
| <b>Task 3: Day of Tournament - Facilitation and Organization</b>              |                                |                               |                              |                                |                               |                            |                              |                                |                               |                |                 |
| Coordination of Facility/Hosting Logistics                                    | 0                              | 0                             | 0                            | 2                              | 6                             | 0                          | 0                            | 0                              | 4                             | \$2,000        | \$3,322         |
| Tournament Facilitation and Gaming Materials and Equipment                    | 10                             | 0                             | 10                           | 10                             | 16                            | 0                          | 0                            | 0                              | 8                             | \$2,000        | \$9,624         |
| Phase Total   | 10                             | 0                             | 10                           | 12                             | 22                            | 0                          | 0                            | 0                              | 12                            | \$4,000        | \$12,946        |
| <b>Task 4: Tournament Follow Up</b>   |                                |                               |                              |                                |                               |                            |                              |                                |                               |                |                 |
| Participant Survey  | 0                              | 0                             | 1                            | 2                              | 16                            | 0                          | 0                            | 0                              | 8                             | \$0            | \$3,004         |
| Presentation at the State Drought Conference                                  | 1                              | 0                             | 2                            | 6                              | 14                            | 0                          | 0                            | 0                              | 0                             | \$0            | \$3,168         |
| Conference Call: Debrief on Tournament  | 2                              | 0                             | 2                            | 3                              | 3                             | 0                          | 0                            | 0                              | 0                             | \$0            | \$1,541         |
| Draft and Final Summary Memo  | 1                              | 0                             | 1                            | 4                              | 16                            | 0                          | 0                            | 0                              | 0                             | \$0            | \$2,958         |
| Phase Total   | 4                              | 0                             | 6                            | 15                             | 49                            | 0                          | 0                            | 0                              | 8                             | \$0            | \$10,671        |
| <b>Task 5: Project Administration</b>   |                                |                               |                              |                                |                               |                            |                              |                                |                               |                |                 |
| Monthly Invoices to CWCB  | 0                              | 0                             | 0                            | 7                              | 12                            | 0                          | 0                            | 6                              | 0                             | \$0            | \$2,958         |
| Monthly Invoices to NIDIS/UCAR  | 0                              | 0                             | 0                            | 7                              | 12                            | 0                          | 0                            | 6                              | 0                             | \$0            | \$2,958         |
| Phase Total   | 0                              | 0                             | 0                            | 14                             | 24                            | 0                          | 0                            | 12                             | 0                             | \$0            | \$5,916         |
| <b>Total Hours</b>  | <b>38</b>                      | <b>3</b>                      | <b>40</b>                    | <b>86</b>                      | <b>258</b>                    | <b>16</b>                  | <b>12</b>                    | <b>12</b>                      | <b>20</b>                     |                | <b>485</b>      |
| <b>Total Cost</b>   | <b>\$7,524</b>                 | <b>\$594</b>                  | <b>\$6,400</b>               | <b>\$12,900</b>                | <b>\$32,250</b>               | <b>\$1,760</b>             | <b>\$816</b>                 | <b>\$816</b>                   | <b>\$1,360</b>                | <b>\$4,220</b> | <b>\$68,640</b> |

