

NOAA FORM 17-4 (4-81)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION		Form Approved OMB Control No. 0648-0025 Expires 05/31/2021	
INITIAL REPORT ON WEATHER MODIFICATION ACTIVITIES				Complete in accordance with instructions on reverse and forward one copy to: National Oceanic and Atmospheric Administration Office of Oceanic and Atmospheric Research 1315 East-West Highway, WWMC-3, Rm 11216 Silver Spring, MD 20910	
This report is required by Public Law 92-205; 85 Stat. 735; 145 U.S.C. 330b. Knowing and willful violation of any rule adopted under the authority of Section 2 of Public Law 92-205 shall subject the person violating such rule to a fine of not more than \$10,000, upon conviction thereof.					
1. PROJECT OR ACTIVITY DESIGNATION, IF ANY			2. DATES OF PROJECT		
3. PURPOSE OF PROJECT OR ACTIVITY			a. DATE FIRST ACTUAL WEATHER MODIFICATION ACTIVITY IS TO BE UNDERTAKEN		
			b. EXPECTED TERMINATION DATE OF WEATHER MODIFICATION ACTIVITIES		
4. (a) SPONSOR			4. (b) OPERATOR		
NAME			NAME		
AFFILIATION		PHONE NUMBER	AFFILIATION		PHONE NUMBER
STREET ADDRESS			STREET ADDRESS		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
5. TARGET AND CONTROL AREAS (See Instructions)					
TARGET AREA			CONTROL AREA		
LOCATION		SIZE OF AREA SQ. MI	LOCATION		SIZE OF AREA SQ. MI
6. DESCRIPTION OF WEATHER MODIFICATION APPARATUS, MODIFICATION AGENTS AND THEIR DISPERSAL RATES, THE TECHNIQUES EMPLOYED, ETC. (See Instructions)					
7. LOG BOOKS Enter name, affiliation, address, and telephone number of responsible individual from whom log books or other records may be obtained.					
NAME					
AFFILIATION			PHONE NUMBER		
STREET ADDRESS					
CITY		STATE	ZIP CODE		
8. SAFETY AND ENVIRONMENT					
YES	NO	Has an Environmental Impact Statement, Federal or State, been filed? If yes, please furnish a copy as applicable.			
YES	NO	Have provisions been made to acquire the latest forecasts, advisories, warnings, etc., of the National Weather Service, Forest Service, or others when issued prior to and during operations? If yes, please specify on a separate sheet.			
YES	NO	Have any safety procedures (<i>operational constraints, provisions for suspension of operations, monitoring methods, etc.</i>) and any environmental guidelines (<i>related to the possible effects of the operations</i>) been included in the operational plans? If yes, please furnish copies or a description of the specific procedures and guidelines.			
9. OPTIONAL REMARKS (See instructions. Use Separate Sheet).					
CERTIFICATION: I certify that all statements in this report on this weather modification project are complete and correct to the best of my knowledge and are made in good faith.			NAME OF REPORTING PERSON		
AFFILIATION			SIGNATURE		
STREET ADDRESS			OFFICIAL TITLE		
CITY	STATE	ZIP CODE	DATE	PHONE NUMBER	

INSTRUCTIONS FOR INITIAL REPORT ON WEATHER MODIFICATION ACTIVITIES

One completed copy of this form is to be received 10 days* or more prior to actual modification activities. A NOAA file number will be assigned by the Administrator after receipt of the initial report for each project or activity.

A supplemental report in letter form referring to the appropriate NOAA file number must be made to the Administrator if the "Initial Report" is found to contain any material inaccuracies, misstatements, omissions, or if there are changes in plans for the project or activity.

*For exceptions, see Sections 908.4(b) and (c), Part 908 of Title 15, Code of Federal Regulations.

- Item 1 Enter designation, if any, used by operator for the project or activity.
- Item 2 Enter: (a) Date first actual weather modification activity is to be undertaken;
 (b) Date on which final weather modification activity is expected to occur.
- Item 3 Enter the purposes of the project or activity: e.g., rainfall increase, hail suppression, cold fog dispersal, etc.
- Item 4 Enter: (a) Name, phone number, affiliation, and address of the primary person for whom the project is to be performed (sponsor).
 (b) Name, phone number, affiliation, and address of the person primarily responsible for carrying out the project (operator).
- Item 5 A map should be attached showing size and location of target area, control area, coded number and location of each item of ground-based weather modification apparatus and coded number and location of key rain gauges, radars, or other precipitation measuring devices. Also show location of airport for airborne operations.
- Item 6 Describe the weather modification apparatus, modification agents, and the techniques to be used. This would include type of ground or airborne apparatus to be used, type of modification material to be dispensed, rate of dispensing material in grams per hour or other appropriate units, type of precipitation gauges to be used in target and control areas, and any other pertinent information such as type of radars, type of aircraft to be used, techniques to be employed (e.g., cloud-based seeding at 10,000 feet msl).
- Item 7 List name, phone number, affiliation, and address of the responsible individual from whom log books or other records may be obtained.
- Item 8 Provide applicable answers to questions as indicated.
- Item 9 This item is to permit the reporting person to include any information not covered by items 1 through 8 but which he feels is significant or of interest. It is also to be used to include any information not covered elsewhere that the Administrator may request.

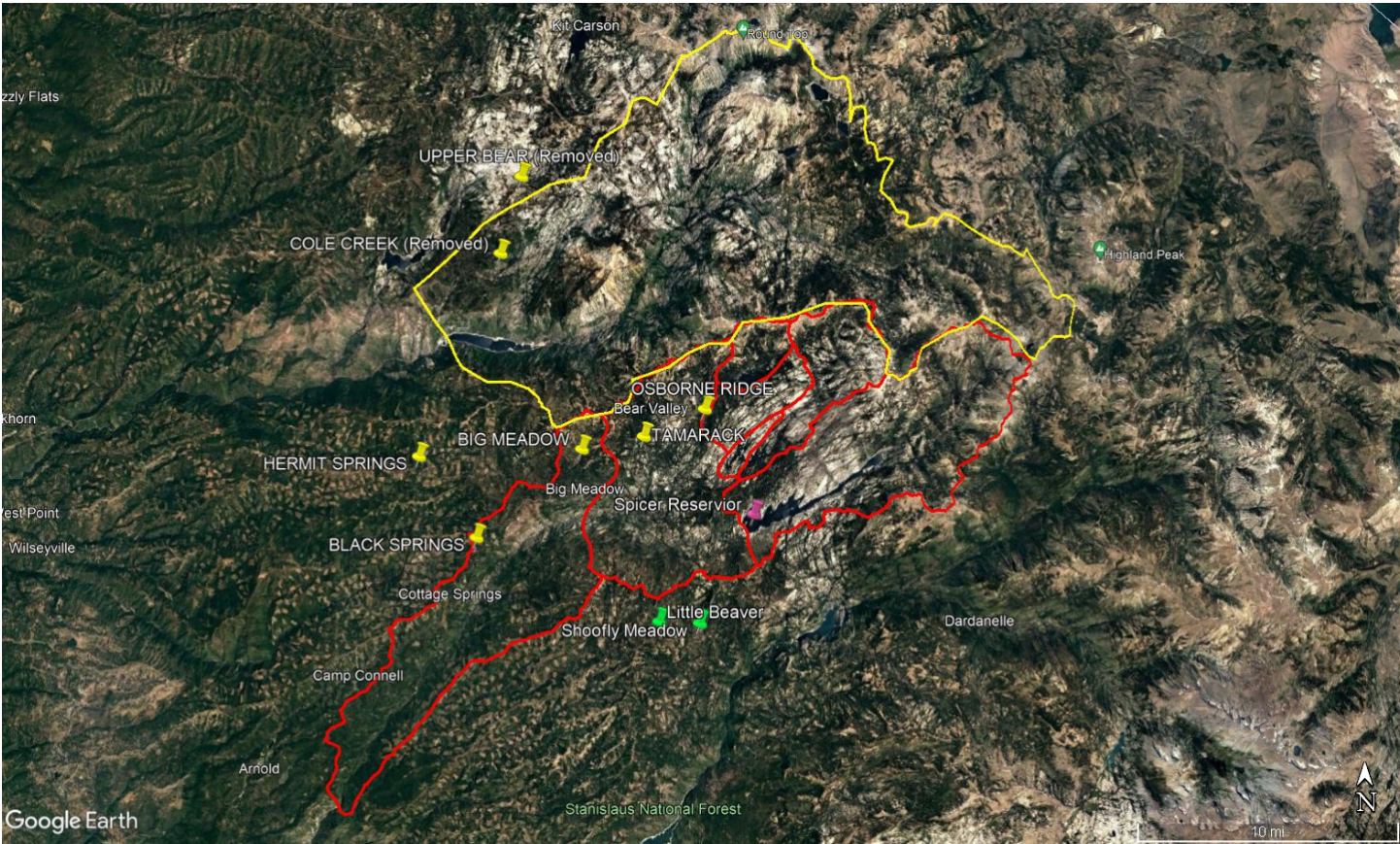
**INFORMATION PROVIDED UNDER THE PROVISIONS
OF THE
PAPERWORK REDUCTION ACT OF 1995**

The Paperwork Reduction Act of 1995 requires that individuals or organizations be provided with the following information if they provide information on paper forms which are collected by the Federal Government.

1. Public Law 92-205, enacted December 18, 1971 (amended by Public Law 94-490, Section 6(b), October 15, 1976) requires that all non-federal weather modification activities in the United States and its territories be reported to the Secretary of Commerce. The National Oceanic and Atmospheric Administration has implemented the Act and the current reporting requirements are published in the Code of Federal Regulations (15 CFR 908).

2. The intent of the program is to increase expertise in the field of weather modification, to allow scientists and other concerned persons to have access to information on current and past efforts at weather modification, to help avoid unneeded and wasteful duplications, to aid in preventing territorial overlapping of weather modification operations, to provide data to assess possible harmful or dangerous activities, and to furnish information to check both desirable and undesirable atmospheric changes against records of weather modification efforts. To meet this objective, information is collected on the location and size of the target area, names and addresses of sponsors and operators, beginning and ending dates of the project, specific purpose, description of apparatus and seeding agents to be used, number of days of operations, number of hours of operations of each type of weather modification apparatus, and total amount of seeding agent used.

3. A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995 unless the information collection has a currently valid OMB Control Number. The approved OMB Control Number for this information collection is 0648-0025. Without this approval, we could not conduct this information collection. Public reporting for this information collection is estimated to be approximately 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. All responses to this information collection are mandatory pursuant to Public Law 92-205, enacted December 18, 1971 (amended by Public Law 94-490, Section 6(b), October 15, 1976). Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the OAR Weather Program Office at Weather.Modification@noaa.gov.



MOKELUMNE WEATHER MODIFICATION
OPERATING INSTRUCTIONS
2021-2022

PG&E's meteorologists in Meteorology Operations and Analytics will direct the cloud seeding operations during the 2021-2022 winter season based on the specifications in Section I of this document and work procedure WP 349-13. The roles of all personnel involved in the Mokelumne Weather Modification Project are specified in Section II of this document.

Section I

The operation of the Mokelumne Weather Modification Project will be dependent on meteorological data obtained from various meteorological forecast models produced by PG&E Meteorology Operations in San Ramon, California as well as the Mt. Reba monitoring site located at the Bear Valley ski resort. Seeding operations will be done according to the following specifications:

A. General Specifications

- 1) Storms which meet the criteria as specified in Section B will be selected for a seed operation for a maximum of twelve hours. Seed orders may be less than twelve hours and no less than six hours at the discretion of the PG&E forecaster.
- 2) The silver iodide burners will be identified and operated by number as follows: 1- RTU#51 (Tamarack), 2 - RTU #52 (Hermit Springs), 3 - RTU #53 (Big Meadow), 4 - RTU #54 (Black Springs), 5 – RTU #55 (Little Beaver), 6 – RTU #56 (Shoofly), and 7 - RTU #57 (Osborne Ridge).
- 3) An actual seeding order will cover a maximum of twelve hours. Orders may be for less than a twelve-hour period at the discretion of the weather forecaster.
- 4) During the seed operation, the weather forecaster may cancel the operation if weather conditions no longer meet seeding criteria for a specific operating mode.

A subsequent seed order may be initiated if the criteria as specified in Section B are met for any of the remaining operating modes.

B. Seeding Criteria

The following criteria are specified as limiting conditions for weather modification operations.

- 1) Seeding will not be started or will cease if underway when the freezing level over the watershed is above 8,500 feet MSL.
- 2) Seeding will not be started or will cease if underway when the average wind speed in the layer from 8,000 feet to the -10° C layer is > 48 knots
- 3) Seeding will not be started or will cease if underway when in the judgment of Ms. C Percival, Mr. K Richards, Mr E Duffey, Mr. K Ericsson, and Mr. N Flaiz if abnormal runoff conditions or heavy snow loading on structures potentially exist in the watershed.
- 4) South storm seeding will be ordered when the most recent forecast model guidance and Mt. Reba wind direction is between 140 and 240 degrees, Mt. Reba temperature is less than 0 degrees C, and Oakland RAOB 700 mb wind speed is less than 50 knots. All burners will be activated for a south order (1- (Tamarack, 2 - Hermit Springs, 3 - Big Meadow 4 - Black Springs, 5 – Little Beaver, 6 – Shoofly, and 7 - Osborne Ridge).
- 5) Southwest storm seeding will be ordered when the most recent forecast model guidance and Mt. Reba wind direction is between 230 and 250 degrees, Mt. Reba temperature is less than 0 degrees C, and Oakland RAOB 700 mb wind speed is less than 50 knots. The burners operated for a southwest order are (1- (Tamarack, 2 - Hermit Springs, 3 - Big Meadow 4 - Black Springs, and 7 - Osborne Ridge). (Do not activate burners 5 and 6).
- 6) Westerly mode (NCPA) storm seeding will be ordered when the most recent forecast model guidance and Mt. Reba wind direction is between 240 and 280 degrees, Mt. Reba temperature is less than 0 degrees C, and Oakland RAOB 700 mb wind speed is less than 50 knots. The burners operated for an NCPA westerly mode order are numbers 1 (Tamarack), 2 (Hermit Springs), 3 (Big Meadow), 4 (Black Springs), and 7 (Osborne Ridge).
- 7) Northwesterly mode (NCPA) storm seeding will be ordered when the most recent forecast model guidance and Mt. Reba wind direction is between 280 and 340 degrees, Mt. Reba temperature is less than 0 degrees C, and Oakland RAOB 700 mb wind speed is less than 50

knots. The burners operated for an NCPA northwesterly mode order are numbers 1 (Tamarack), 3 (Big Meadow), and 7 (Osborne Ridge).

Section II

Successful operation of the Mokelumne Weather Modification Project depends on the coordinated actions of PG&E Meteorology Operations, Operators at Tiger Creek Powerhouse, and support personnel at Angels Camp. The roles of these personnel follow:

A. Seeding Procedures

Weather Forecaster--PG&E Meteorology Operations

- 1) The weather forecaster will issue seeding instructions to the operators at Tiger Creek Operations Center.
- 2) All orders for silver iodide burner operations will be logged via email correspondence and on the cloud seeding order form in the space provided (Figure 1). All cancellations and the reason therefore must also be logged via email correspondence and on the cloud seeding order form.
- 3) The weather forecaster will be responsible for informing, Ms. C Percival, Mr. K Richards, Ms Annie Zaccarin, Mr E Duffey, Mr. K Ericsson, and Mr. N Flaiz of an approaching severe storm that could produce flooding or heavy snow loading on structures in or surrounding the Mokelumne watershed and/or downstream of the watershed.
- 4) The weather forecaster will be responsible for maintaining data files and completing the verification of cloud seeding form.
- 5) Weather forecaster availability during the weather modification season will be 0500 through 1500 PST with extension to later hours, as needed, during cloud seeding operations. These office hours will be maintained on both weekdays and weekends.

Forecaster Office Phone:

Company – 244-4630/4632

Outside - (925) 244-4630/4632

Powerhouse Operators--Tiger Creek Operations Center:

- 1) The Tiger Creek operator will control the silver iodide burners in accordance with the instructions received from the weather forecaster.
- 2) All instruction received from the weather forecaster will be logged on the form entitled, "Record of Cloud Seeding Operations," Figure 2. The original will be mailed via company mail to Neil Flaiz, Meteorology Operations and Analytics, 6121 Bollinger Canyon Road, Bldg. Z1, San Ramon, CA 94583 on a weekly basis. A copy will be retained at the Tiger Creek Operations Center.

B. Routine Equipment Service and Calibration

Angels Camp personnel will be responsible for installing and servicing all seeding burners as needed based on burner diagnostic output from the Pi ProcessBook data screen.

C. Routine Data Collection

Angels Camp personnel will be responsible for collecting all pertinent burner operation data in accordance with the following schedule:

- 1) All burner maintenance logs (Figure 3) should be completed following each service visit.
- 2) A detailed operational summary of each seeder will be sent via electronic mail or company mail to Neil Flaiz, Meteorology Operations and Analytics, 6121 Bollinger Canyon Road, Bldg. Z1, San Ramon, CA 94583 on a weekly basis.

D. Reporting

PG&E Meteorology Operations will be responsible for data reduction, evaluation and reporting. Reports as required by the State of California and the federal government will be completed and distributed to the following:

Eric Van Deuren

Tyler Covich

Kevin Richards

Evan Duffey

Catherine Percival

Ken Ericsson

State - Department of Water Resources

Federal - National Oceanic and Atmospheric Administration
Office of Oceanic and Atmospheric Research

Figure 1
CLOUD SEEDING ORDER FORM
SEASON: 2021-2022
WATERSHED: MOKELUMNE

TIGER CREEK OPERATIONS CENTER: 8-841-2601 or 209-295-2601

Orders Issued To Tiger Creek Operations Center	Local Time		Remarks/Cancellations
	Start Date/Hour	Stop Date/Hour	
ORDER # _____			Issued By: Instructions given to: Remarks:
<input type="checkbox"/> S 150°-225° <input type="checkbox"/> SW 226°-250°	____/____/____ ____:____	____/____/____ ____:____	
ORDER # _____			Issued By: Instructions given to: Remarks:
<input type="checkbox"/> S 150°-225° <input type="checkbox"/> SW 226°-250°	____/____/____ ____:____	____/____/____ ____:____	
ORDER # _____			Issued By: Instructions given to: Remarks:
<input type="checkbox"/> S 150°-225° <input type="checkbox"/> SW 226°-250°	____/____/____ ____:____	____/____/____ ____:____	
ORDER # _____			Issued By: Instructions given to: Remarks:
<input type="checkbox"/> S 150°-225° <input type="checkbox"/> SW 226°-250°	____/____/____ ____:____	____/____/____ ____:____	

**FIGURE 2
RECORD OF CLOUD SEEDING OPERATIONS
ANGELS CAMP OPERATIONS CENTER**

Date: _____

Order Number	Code Order			Start		Stop		Order Received
	S	SW	NW	Date	Time	Date	Time	By

Code Orders	Angular Sector	Agl Burners Operated
South	150 deg. to 225 deg.	1-3-4-7
Southwest	226 deg. to 250 deg.	1-2-3-4-5-6-7
Northwest	251 deg. to 325 deg.	5-6

Order Number	Actual Start		Actual Stop		Remarks
	Date	Time	Date	Time	

**FIGURE 3
SILVER IODIDE BURNER MAINTENANCE LOG**

SITE: _____ DATE: _____ TIME: _____

1. PILOT LIGHTS: BURNING - YES _____ NO _____
COMMENTS: _____

2. PILOT GENERATORS: NO LOAD VOLTAGE: _____
COMMENTS: _____

3. ATOMIZER:
PROPANE SIDE: OPEN _____ PLUGGED: _____
SOLUTION SIDE: OPEN _____ PLUGGED: _____
COMMENTS: _____

4. AGI SOLUTION: FLOWRATE _____ GPH
PUMP RPM _____

5. PUMP MOTOR: FUNCTIONS - YES _____ NO _____

6. SOLUTION PUMP: TUBING CHANGED - YES _____ NO _____

*7. AGI SOLUTION LEVEL IN TANK: BEGINNING INCHES OF LIQUID IN TUBE: _____
SOLUTION ADDED: - YES _____ NO _____
FINAL LEVEL IN TANK: _____ (INCHES)

8. PROPANE: TANK GAGE NO. 1 _____ NO. 2 _____
TANK IN USE: NO. _____

9. 12 VOLT BATTERIES: VOLTS _____
COMMENTS: _____

10. SOLAR PANEL: COVERED _____ OPEN _____
VOLTAGE OUTPUT: _____

11. RADIO RECEIVER AND TIMER: ON SIGNAL RECEIVED - YES _____ NO _____
OFF SIGNAL RECEIVED - YES _____ NO _____
TIMER FUNCTIONS - YES _____ NO _____
COMMENTS: _____

12. PRESSURE RECORDER: CHART DRIVE FUNCTIONS - YES _____ NO _____
PEN INKING - YES _____ NO _____

13. SHUT DOWN DEVICE: OPERATING - YES _____ NO _____
TIMER COUNT _____ SECONDS

14. SITE CONDITION AS LEFT: OPERATIONAL - YES _____ NO _____
COMMENTS: _____

15. SPARE PARTS USED: _____

* PLEASE CLEARLY NOTE:

- A. On the cloud seeding burner chart, the date and time the chart was placed ON and taken OFF the recorder.
- B. Beginning inches of AGI liquid in tube, and final level in the tank after solution added.