

July 2020

Water Policy Interim Committee
Jason Mohr

FINAL REPORT TO THE 67TH MONTANA LEGISLATURE

HJ40: SEEDING CLOUDS

WATER POLICY INTERIM COMMITTEE MEMBERS

Before the close of each legislative session, the House and Senate leadership appoint lawmakers to interim committees. The members of the Water Policy Interim Committee, like most other interim committees, serve one 20-month term. Members who are reelected to the Legislature, subject to overall term limits and if appointed, may serve again on an interim committee. This information is included in order to comply with 2-15-155, MCA.

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This report is a summary of the work of the Water Policy Interim

Committee, specific to the Water Policy Interim Committee’s 2019-20 study as outlined in the Water Policy Interim Committee’s 2019-20 work plan and House Joint Resolution 40 (2019). Members received additional information and public testimony on the subject, and this report is an effort to highlight key information and the processes followed by the Water Policy Interim Committee in reaching its conclusions. To review additional information, including audio minutes, and exhibits, visit the Water Policy Interim Committee website: www.leg.mt.gov/water.

A full report including links to the documents referenced in this print report is available at the Water Policy Interim Committee website: www.leg.mt.gov/water.

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HJ40: SEEDING CLOUDS

HJ40: A STUDY OF WEATHER MODIFICATION

HJ40 is a study of weather modification, also known as “cloud seeding.” The process involves introduction of substances into the air to cause condensation in clouds and to precipitate rain or snowfall. Weather modification techniques may also be used to reduce the size and severity of hailstones or the effects of fog.

Although "centuries of rainmakers" employing "a healthy dose of guesswork, quackery, and fraud" attempted to modify the weather, modern cloud seeding is generally attributed to three General Electric scientists working in the company's Schenectady, New York, labs in 1946.¹

The effectiveness of weather modification has been widely debated—indeed some refer to it as "cloud rustling"—but according to the North American Weather Modification Council:

Numerous evaluations have indicated that cloud seeding, when properly applied, can produce precipitation increases up to 10 percent or greater. Studies of hail suppression seeding indicate hail damage reductions up to 45 percent. Agricultural wheat production in seeded areas has increased by 5.9 percent in North Dakota.²

Montana state laws regulating weather modification date to 1967 with the passage of the Weather Modification and Control Act. Soon after the passage of the act, Montana State University researchers launched an "experimental winter orographic cloud seeding program" in the Bridger Range.³ The project was part of the U.S. Bureau of Reclamation's Project Skywater, which tested the technology in Western drainages “to explore, develop and determine the feasibility of applying the technology of weather modification to meet the nation’s increasing demand for clean water.”⁴



MODIFIED AIRCRAFT FOR CLOUD SEEDING. (IDAHO POWER CO.)

¹ Jedediah S. Brown, Bureau of Reclamation, *Project Skywater* (2009).

² <http://www.nawmc.org/faq/>

³ Arlin B. Super and James A. Heimbach, Jr., "Evaluation of the Bridger Range Winter Cloud Seeding Experiment Using Control Gauges," *Journal of Climate and Applied Methodology* (1990).

⁴ Jedediah S. Brown, Bureau of Reclamation, *Project Skywater* (2009), 2. Brown adds for Project Skywater: "Reclamation concentrated studies and testing in the western states, principally in the upper Colorado River basin and along the Sierra Nevada in California, for the purposes of managing and mining water resources, as well as for national defense, public health, and technological development. Never well-funded, the program had a decidedly mixed cost-benefit, environmental, and operational record that never convincingly supported a sound basis for a national, extensively funded weather modification program."

HJ40: SEEDING CLOUDS

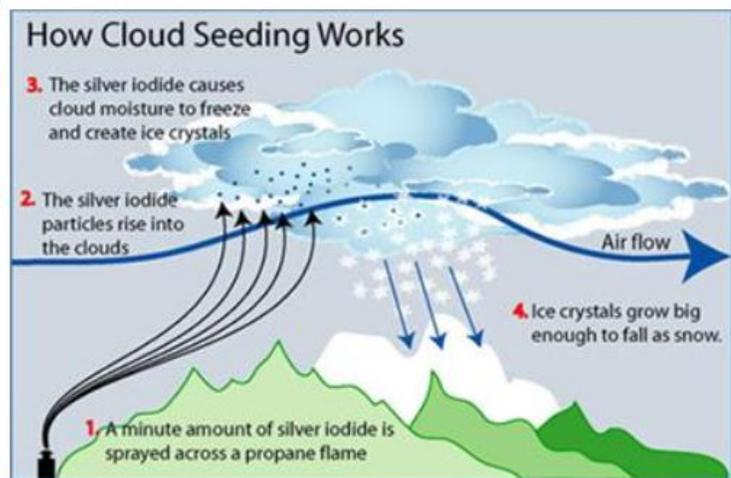
While not scientifically conclusive, researchers of the Bridger Range cloud seeding experiment later concluded "the statistical analysis suggests that seeding increased snowfall in the intended target area and sometimes further downwind as well, when the temperature near the top of the Main Ridge was colder than about minus 9 degrees Centigrade."

It was the Legislature's action in 1993 that clearly defined the regulatory landscape for weather modification in Montana. This legislation was passed due to concerns about the weather modification activities in Montana's atmosphere by a North Dakota agency. As a result, no weather modifications activities have occurred in the state for nearly three decades.

THE TECHNIQUE

Weather modification can generally be divided into cold- and warm-weather cloud seeding. Cold-weather seeding aids in snowmaking; warm-weather seeding increases rainfall or tempers hailstorms.

The focus of cold-weather seeding "aids precipitation formation by enhancing ice crystal production in clouds. When the ice crystals grow sufficiently, they become snowflakes and fall to the ground."⁵ Silver iodide is typically used to "seed" the clouds, due to its "environmental safety and superior efficiency."⁶ An Idaho Power Company scientist told the WPIC the company's weather modification efforts are primarily to increase snowpack, estimating runoff increases of 80,000–270,000 acre feet a year.⁷



WATER INFORMATION PROGRAM, SOUTHWESTERN WATER CONSERVATION DISTRICT (COLO.)

There are two ways to seed a cloud: either through a ground-based generator or a fixed-wing aircraft. Burn-in-place flares are mounted on a modified aircraft to seed a cloud; propane-fired burn heads cast the silver iodide into the air. In either instance, atmospheric conditions must be right for a weather modification activity to work.

Warm-weather seeding focuses on increasing rain precipitation and reducing hailstorms and fog. Warm-weather seeding also uses dry ice (solid carbon dioxide) in addition to silver iodide. The warm-weather

⁵ North American Weather Modification Council brochure, "Understanding Cold Season Cloud Seeding (2019)."

⁶ Kevin Smith, Engineering Bureau chief, Water Quality Division (Department of Environmental Quality) testified to the WPIC on March 9, 2020, that silver iodide is stable in water, and that a review of cloud seeding operations found low levels of silver iodide. Smith said the DEQ would monitor for silver iodide for authorized weather modification activities.

⁷ Testimony of Derek Blestrud, senior atmospheric scientist, Idaho Power Co., to the WPIC, Sept. 10, 2019.

HJ40: SEEDING CLOUDS

seeding technique is principally the same as the cold-weather: Silver iodide or dry ice particles help convert supercooled water droplets to ice crystals and eventually snowflakes that melt and become rain.⁸ Other salt compounds enhance the ability of the cloud to produce raindrops large enough to fall to the ground. For hail, "cloud seeding is used to increase competition for cloud water through the addition of more, efficient ice nuclei, and to spread the energy released by the storm over a larger area."⁹

A LICENSE AND A PERMIT

To conduct a weather modification operation, an applicant must acquire a license and a permit. The Department of Natural Resources and Conservation issues both. (Certain research, development, and experiments conducted by qualified agencies and organizations are exempt from licensing and permitting.)

Weather modification licenses are straightforward: an applicant must "demonstrate competence in the field of meteorology to the satisfaction of the department"¹⁰ and pay \$100.¹¹ These licenses must be renewed annually.¹²

Permits, which a licensed applicant must receive annually for each operation covering one geographic area, are more rigorous.¹³ Permit requirements include:

- A fee of 1 percent of estimated operation costs
- \$10 million proof of financial responsibility¹⁴ to meet "the applicant's ability to respond in damages for liability that might reasonably be attached to or result from the applicants' weather modification and control activities"¹⁵
- An environmental impact statement prepared by the DNRC
- A public meeting
- Publication of notice of intention to conduct weather modification operation

A regulatory scheme that appears to prohibit the activity may seem incongruous to some; the events that led to the passage of Senate Bill 72 in 1993 are at the root cause.

⁸ North American Weather Modification Council brochure, "Understanding Warm Season Cloud Seeding (2018)."

⁹ Ibid.

¹⁰ Section 85-3-203, MCA.

¹¹ Section 85-3-205, MCA.

¹² Section 85-3-204, MCA.

¹³ Section 85-3-206, MCA.

¹⁴ Section 36.20.303, ARM.

¹⁵ Section 85-3-211, MCA.

HJ40: SEEDING CLOUDS

SB72: "SHOOTING AT AIRPLANES"

Senate Bill 72 (1993) added the defining characteristics to Montana's weather modification policy. Signed into law by Gov. Marc Racicot, it dramatically toughened requirements first passed in 1967.

One of two bills proposed by Sen. Gerry Devlin of Terry, SB72 was in direct response to an application by the North Dakota Atmospheric Resources Board. A Montana board initially denied the application, but a judge ordered it to be issued.

Devlin said the reason for the bill was a lack of public input on the North Dakota application, which proposed to cloud seed in eastern Montana for the benefit of western North Dakota. Devlin said he feared "people might start shooting at airplanes" unless his bill passed.¹⁶ Most notably, the bill added "proof of financial responsibility," an environmental impact statement,¹⁷ and a public meeting requirement.

Since the passage of SB72, the DNRC has issued annual licenses, but no permits.

REGIONAL WEATHER MODIFICATION LAWS

A WPIC-requested survey of the laws and policies in Montana's neighboring states suggests these states have less-restrictive laws, allowing for various weather modification projects.¹⁸ Programs in these states appear to encourage research and use of weather modification.¹⁹ Some state-supported projects cover large areas of these states. In others, weather modification projects are conducted by locally created districts or private companies.

Less-restrictive laws in five nearby states appear to have encouraged more weather modification projects. How each state constructs its regulatory scheme varies.²⁰



NORTH AMERICAN WEATHER MODIFICATION COUNCIL (NAWMC.ORG)

¹⁶ Testimony of Sen. Devlin to Senate Natural Resources Committee, Jan. 15, 1993. See Appendix B.

¹⁷ Section 85-3-202, MCA. An environmental impact statement is the most rigorous environmental assessment provided by the Montana Environmental Policy Act.

¹⁸ Legislative Environmental Policy Office memo to WPIC, "Regional Weather Modification Laws," Feb. 28, 2020. See Appendix C.

¹⁹ The states surveyed are: Montana, Colorado, Idaho, North Dakota, Utah, and Wyoming. The review also looked at federal laws related to weather modification and at the major, privately funded, cloud-seeding project in Alberta.

²⁰ See more details in the Legislative Environmental Policy Office memo to WPIC, "Regional Weather Modification Laws," Feb. 28, 2020. See Appendix C.

HJ40: SEEDING CLOUDS

Some states have few regulations. For example, in Idaho there is no permitting requirement. Operators must file a log of activities.²¹ Operators range from small water districts to larger projects like Idaho Power Company, which has an annual budget of \$4.2 million, three aircraft, and 55 remote cloud-seeding units.²²

Other states rely on a centralized authority. In Colorado, the state Department of Natural Resources administers eight projects to benefit mostly irrigators and ski areas. The North Dakota Atmospheric Resource Board administers projects in that state, include the North Dakota Cloud Modification Project, which benefits six western counties.

Portions of central Alberta are known as "Hailstorm Alley." After repeated hailstorms caused millions in damages, 20 insurance companies formed the Alberta Severe Weather Management Society in 1996. The society contracts with a North Dakota firm to conduct the aerial-based project, which reportedly costs \$5 million annually.²³

The impacts of the Alberta project are not clear, according to company that statistically models risk for insurance companies and other organizations.²⁴ Further research appears to be necessary to determine advantages and liabilities of cloud seeding.

FINDINGS, RECOMMENDATIONS, LEGISLATION

As of Sept. 15, 2020, this section is pending committee action.

LIST OF APPENDICES

Appendix A	Summary of Licensing and Permitting for Weather Modification in Montana
B	Legislative Services Division memo to WPIC, "Legislative History for SB72," December 2019.
C	Legislative Environmental Policy Office memo to WPIC, "Regional Weather Modification Laws," Feb. 28, 2020
D	Written public comments on HJ40 draft report received Sept. 10, 2020

²¹ The federal government required reporting to the National Oceanic and Atmospheric Administration. This report must include the date of the activity, purpose, modification agents used, and method employed. National Oceanic and Atmospheric Administration, <https://library.noaa.gov/Collections/Digital-Collections/Weather-Modification-Project-Reports>.

²² Testimony of Derek Blestrud, senior atmospheric scientist, Idaho Power Co., to the WPIC, Sept. 10, 2019.

²³ Globalnews.ca, *Everything You Need to Know About Thunderstorm Alley in Alberta*, May 2018.

²⁴ Email from Matthew Nielsen, government and regulatory affairs senior director, RMS, Inc. to WPIC staff, Aug. 31, 2020.



Summary of Licensing and Permitting for Weather Modification Operations in Montana



Prepared for Water Policy Interim Committee
September 10, 2019
Prepared by MT DNRC

Purpose

To assure that all weather modification operations within Montana are conducted by qualified operators and are in the public good.

Definitions

- * **Applicant** – Any person, political subdivision, public or private corporation, partnership, or other entity that wishes to obtain a weather modification license or permit.
- * **License** – Authorization to supervise the conduct of a weather modification operation.
- * **Operation** – Weather modification and control activities undertaken within one geographical area over a continuing time interval not to exceed 1 year.
- * **Permit** – Authorization to engage in a specific weather modification operation.
- * **Weather Modification and Control** – Changing or controlling or attempting to control, by artificial methods, the natural development of atmospheric cloud forms or precipitation forms that occur in the troposphere (lowest part of the atmosphere where most weather changes occur).

Historical Background

- * 1967 – 40th Legislature passed Montana’s first Weather Modification and Control Act.
- * 1970’s – MT participated in a weather modification research program known as HIPLEX (High Plains Cooperative Research Program). HIPLEX was sponsored by the Bureau of Reclamation and operated around Miles City, MT.
- * 1970’s – 1980’ – MT routinely granted a weather modification license and permit to North Dakota.
 - o North Dakota has an active summer time cloud seeding program involving 7 counties along the border with MT. North Dakota claims they must begin seeding clouds in MT air space to account for the lag time between seeding and the “production” of rain.
- * 1986 – 1987 – Snow pack augmentation program implemented in the Bridger Range near Bozeman.
- * 1993 – 53rd Legislature revised the licensing and permitting process (SB72) in response to citizens in eastern MT who were concerned that North Dakota was “stealing” rain from MT.
 - o SB72 added the requirement for DNRC to prepare an Environmental Impact Statement and for the applicant to demonstrate proof of financial responsibility. MT has not granted a weather modification permit since the passage of SB72.
- * 2003 – 58th Legislature attempted to revise the licensing and permitting process through HB644. The bill would have:
 - o Limited weather modification operations to winter time (Nov 1 – March 15).
 - o Removed permitting requirements.
 - o Removed requirement for Environmental Impact Statement.
 - o Passed House. Tabled in Senate Committee on Agriculture, Livestock and Irrigation.

Licensing and Permitting Process

- * MT requires a License and Permit to engage in weather modification and control activities.

❄ Exemptions –

- Research, development, and experiments conducted by qualified agencies and organizations. Qualified agencies and organizations include: State and federal agencies, institutions of higher learning, and nonprofit research organizations.
- Emergency activities for protection against fire, frost, sleet, or fog.
- Normal activities engaged in for purposes other than those of inducing, increasing, decreasing, or preventing precipitation or hail.

❄ Requirements for License

- Form No. 670-N-278.
- Fee - \$100
- Qualifications - Demonstrate competence in the field of weather modification and meteorology.
 - Competence can be shown through a combination of education and work experience in the conduct of weather modification operations. **Minimum** work experience is 1 full year in a responsible position involving the management and control of weather modification operations.
 - If the applicant is an organization, the qualification requirement applies to the individual who will oversee the operation for the applicant.

❄ Requirements for Permit

- Form No. 672-N-278.
- Fee - equivalent to 1% of the estimated cost of the operation.
- Proof of Financial Responsibility - \$10 million (bond, insurance, negotiable securities, cash, other).
 - Applicant must show ability to respond in damages for liability that might reasonably be attached to, or result from, the proposed weather modification and control activities.
 - Damages include, but are not limited to, losses from flood, lightning-induced fire, hail, or erosion, including those losses that develop after the operation is concluded.
- Operating Plan – The “who”, “what”, “when”, “where”, “why” and “how”.
- Notice of Intention – Public notification to undertake weather modification and control activities.

Application Review Process - DNRC

- ❄ Prepare a report and an Environmental Impact Statement (EIS).
- ❄ Conduct additional analyses as necessary to evaluate information provided by the applicant.
- ❄ Conduct at least 1 public meeting in the area affected by the proposed operation.
- ❄ Publish the Notice of Intention.
- ❄ Hold a public hearing.
- ❄ DNRC’s actual cost of preparing the EIS and report, conducting the public meeting(s), publishing the Notice of Intention, and holding the public hearing, must be paid by the applicant.

Threshold Criteria

- ❄ Applicant must establish by a preponderance of evidence that the operation:
 - Is for the general welfare and the public good.
 - Is reasonably designed to improve water quantity or quality, reduce loss from weather hazards, provide economic benefits for the people of Montana, or advance scientific knowledge.

- Is designed to include adequate safeguards to minimize or avoid possible damage to the public health, safety, and welfare and to the environment.
- Will not adversely affect another operation for which a permit has been issued.

Limitations

- ✳️ Permits are subject to terms, conditions, restrictions, and limitations to assure that the operation would be for the general welfare and public good.
- ✳️ DNRC may modify, revoke, or refuse to renew any license or permit.

Record Keeping,

- ✳️ Applicant records and reporting:
 - Daily record keeping.
 - Monthly reporting.
 - End of Operation report.
 - All records and reports are available for public inspection.

County Weather Modification Authority

- ✳️ Residents of a county may establish a county Weather Modification Authority.
- ✳️ Authority can be established (and abolished) by petition, resolution or election
- ✳️ Authority can contract for weather modification services.
- ✳️ Authority may certify to the board of county commissioners a tax on the taxable value of all taxable property in the county to raise money for the county's weather modification activities.

Application Timeframe

- ✳️ Application must be submitted to DNRC at least 180 days prior to the intended start date for the operation.

Additional Information

- ✳️ **Title 85, chapter 3, parts 1-4 Montana Code Annotated (MCA)** – Laws enacted by the Legislature governing the licensing and permitting of atmospheric weather modification activities.
- ✳️ **Title 36, chapter 20, subchapters 1-4 Administrative Rules of Montana (ARM)** - Administrative Rules adopted by DNRC for implementing the weather modification statutes found in Title 85, chapter 3.

Legislative History for:

Bill: SB 72 Session: 1993 Chapter: 611

- ✓ Final History and Status Timeline
- ✓ Introduced Bill .01
- ✓ Fiscal Note
- ✓ Minutes of hearing in first chamber, including first page and relevant section. Includes:
 - ▶ Visitor's register
 - ▶ Roll call
 - ▶ Exhibits

Jan. 15, 1993 Senate Natural Resources
- Minutes of executive action in first chamber, including first page and relevant section

Feb. 5, 1993 Senate Natural Resources - amended .02
- Minutes from 2nd reading on the floor Feb. 8, 1993
- Minutes of hearing in second chamber, including first page and relevant section. Includes:
 - ▶ Visitor's register
 - ▶ Roll call
 - ▶ Exhibits

March 17, 1993 House Natural Resources
- Minutes of executive action in second chamber, including first page and relevant section
 - ▶ Roll call
 - ▶ Standing committee report

March 26, 1993 House Natural Resources - amended .03
- Minutes from 2nd reading on the floor March 30, 1993 concurred in March 31, 1993 - recircled
April 1, 1993 - concurs as amended .04
- Additional actions (conference committee, governor amendment, governor veto)

April 3, 1993 Senate rejects House amendments

April 15, 1993 Conference Committee - amended .05

April 16, 1993 Senate adopts Conf. Committee

April 16, 1993 House adopts Conf. Committee
- Reference bill - 05

SB 71 INTRODUCED BY TOWE, ET AL.
 PROVIDE AN INCENTIVE FOR REDUCING POSITIONS IN A DEPARTMENT

12/29	INTRODUCED		
1/02	REFERRED TO FINANCE & CLAIMS		
1/04	FIRST READING		
1/15	HEARING		
1/15	COMMITTEE REPORT—BILL PASSED AS AMENDED		
1/18	2ND READING PASSED AS AMENDED	38	10
1/19	3RD READING PASSED	40	8
	TRANSMITTED TO HOUSE		
1/20	FIRST READING		
1/20	REFERRED TO APPROPRIATIONS		
1/27	HEARING		
3/30	COMMITTEE REPORT—BILL CONCURRED AS AMENDED		
3/31	2ND READING CONCURRED	90	9
4/01	3RD READING CONCURRED	84	15
	RETURNED TO SENATE WITH AMENDMENTS		
4/03	2ND READING AMENDMENTS CONCURRED	47	0
4/05	3RD READING AMENDMENTS CONCURRED	50	0
4/07	SIGNED BY PRESIDENT		
4/07	SIGNED BY SPEAKER		
4/13	TRANSMITTED TO GOVERNOR		
	RETURNED TO SENATE WITH GOVERNOR'S AMENDMENTS		
4/16	2ND READING GOVERNOR'S AMENDMENTS		
4/19	CONCURRED	49	0
4/20	3RD READING GOVERNOR'S AMENDMENTS		
	CONCURRED	47	0
	TRANSMITTED TO HOUSE		
4/22	2ND READING GOVERNOR'S AMENDMENTS		
	CONCURRED	95	4
4/22	3RD READING GOVERNOR'S AMENDMENTS		
	CONCURRED	95	3
	RETURNED TO SENATE		
4/24	SIGNED BY PRESIDENT		
4/24	SIGNED BY SPEAKER		
4/27	TRANSMITTED TO GOVERNOR		
5/03	SIGNED BY GOVERNOR		
	CHAPTER NUMBER 601		
	EFFECTIVE DATE: 07/01/93		

SB 72 INTRODUCED BY DEVLIN, ET AL.
 REVISE ATMOSPHERIC WEATHER MODIFICATION APPLICATION AND PERMIT PROCESSES

12/29	INTRODUCED		
1/02	REFERRED TO NATURAL RESOURCES		
1/04	FIRST READING		
1/04	FISCAL NOTE REQUESTED		
1/11	FISCAL NOTE RECEIVED		
1/11	FISCAL NOTE PRINTED		
1/15	HEARING		
2/06	COMMITTEE REPORT—BILL PASSED AS AMENDED		
2/08	2ND READING PASSED	47	1
2/09	3RD READING PASSED	50	0
	TRANSMITTED TO HOUSE		
2/10	REFERRED TO NATURAL RESOURCES		
2/10	FIRST READING		

3/17	HEARING		
3/29	COMMITTEE REPORT—BILL CONCURRED AS AMENDED		
3/30	2ND READING CONCURRED	95	5
3/31	RECONSIDERED PREVIOUS ACTION AND PLACED BACK ON 2ND READING		
4/01	2ND READING CONCURRED AS AMENDED	93	5
4/01	3RD READING CONCURRED	89	8
	RETURNED TO SENATE WITH AMENDMENTS		
4/03	2ND READING AMENDMENTS NOT CONCURRED	46	1
4/06	CONFERENCE COMMITTEE APPOINTED		
4/15	CONFERENCE COMMITTEE REPORT NO. 1		
4/16	2ND READING CONFERENCE COMMITTEE REPORT NO. 1 ADOPTED	49	0
4/17	3RD READING CONFERENCE COMMITTEE REPORT NO. 1 ADOPTED	39	0
	HOUSE		
4/07	CONFERENCE COMMITTEE APPOINTED		
4/15	CONFERENCE COMMITTEE REPORT NO. 1		
4/16	2ND READING CONFERENCE COMMITTEE REPORT NO. 1 ADOPTED	93	5
4/19	3RD READING CONFERENCE COMMITTEE REPORT NO. 1 ADOPTED	95	4
4/24	SIGNED BY PRESIDENT		
4/24	SIGNED BY SPEAKER		
4/27	TRANSMITTED TO GOVERNOR		
5/05	SIGNED BY GOVERNOR CHAPTER NUMBER 611 EFFECTIVE DATE: 05/05/93		

INTRODUCED BY DEVLIN, ET AL.

CREATE PENALTY FOR FAILURE OF A RAILROAD CORPORATION TO
MAINTAIN FENCES

12/29	INTRODUCED		
1/02	REFERRED TO AGRICULTURE, LIVESTOCK & IRRIGATION		
1/04	FIRST READING		
1/04	FISCAL NOTE REQUESTED		
1/08	FISCAL NOTE RECEIVED		
1/08	FISCAL NOTE PRINTED		
1/15	HEARING		
1/21	COMMITTEE REPORT—BILL PASSED AS AMENDED		
1/22	2ND READING PASSED	49	0
1/23	3RD READING PASSED	45	1
	TRANSMITTED TO HOUSE		
1/25	FIRST READING		
1/25	REFERRED TO AGRICULTURE, LIVESTOCK & IRRIGATION		
2/09	HEARING		
2/11	COMMITTEE REPORT—BILL CONCURRED		
3/30	2ND READING CONCURRED	68	29
4/01	3RD READING CONCURRED	69	26
	RETURNED TO SENATE		
4/07	SIGNED BY PRESIDENT		
4/07	SIGNED BY SPEAKER		
4/13	TRANSMITTED TO GOVERNOR		
4/16	SIGNED BY GOVERNOR CHAPTER NUMBER 363 EFFECTIVE DATE: 10/01/93		

STATE OF MONTANA - FISCAL NOTE
Form BD-15

In compliance with a written request, there is hereby submitted a Fiscal Note for SB0072, as introduced.

DESCRIPTION OF PROPOSED LEGISLATION:

The bill will amend the weather modification and control statutes in Montana to require an environmental impact statement for all permit applications, require payment of all costs associated with administrative processing of applications, require public meetings and hearings for all applications, and submit Board of Natural Resources and Conservation approvals of applications to a local vote within counties affected by the weather modification activities.

ASSUMPTIONS:

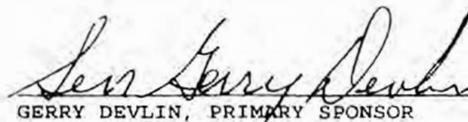
1. Administrative processing requirements for weather modification activities will increase.
2. No general fund for weather modification administration is currently provided.
3. Fees and expenses for administration are collected and deposited in a state special revenue account.
4. EIS fees are collected from applicant and are immediately allocated to reimburse agency for analyses costs.
5. Costs associated with application processing will be borne by the weather modification permit applicants.
6. Minimal or no local influx of weather modification money into local economies has recently occurred.
7. Local elections are a county responsibility which cost \$12,500 per county.
8. Election fees are collected from the applicant and deposited in a county earmarked account.
9. A minimum of two counties will vote on any application.

FISCAL IMPACT: The applicant's expense to pursue Board of Natural Resources and Conservation action is expected to increase since the cost of completing an environmental impact statement is mandated by the application process. Holding an election in the counties affected by the proposed weather modification activities is an additional application cost.

Expenditures: Expenditures are unknown, but any expenditures which may occur will be reimbursed to the agency by the applicant.

EFFECT ON COUNTY OR OTHER LOCAL REVENUES OR EXPENDITURES: Local elections will be required which will necessitate the hiring of persons to conduct the elections. Some local consultants may be contracted to perform environmental analyses and to draft an environmental impact statement for the applications. These local costs would be reimbursed by the applicant.


DAVID LEWIS, BUDGET DIRECTOR DATE
Office of Budget and Program Planning

 43
GERRY DEVLIN, PRIMARY SPONSOR DATE

Fiscal Note for SB0072, as introduced

SB 72

1 SENATE BILL NO. 72
2 INTRODUCED BY DEVLIN

3
4 A BILL FOR AN ACT ENTITLED: "AN ACT AMENDING THE
5 ATMOSPHERIC WATER WEATHER MODIFICATION LAW BY INCLUDING IN
6 THE APPLICATION REVIEW PROCESS REQUIREMENTS FOR CERTAIN
7 ENVIRONMENTAL INFORMATION AND A PUBLIC MEETING; REVISING THE
8 PERMIT ISSUANCE PROCESS TO INCLUDE PAYMENT OF COSTS,
9 CRITERIA FOR DETERMINING WHAT CONSTITUTES THE GENERAL
10 WELFARE AND THE PUBLIC GOOD, PUBLIC HEARING PROCEDURES, AND
11 A PUBLIC VOTE IN AFFECTED COUNTIES; AMENDING SECTIONS
12 85-3-202 AND 85-3-206, MCA; AND PROVIDING AN IMMEDIATE
13 EFFECTIVE DATE AND AN APPLICABILITY DATE."

14
15 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

16 Section 1. Section 85-3-202, MCA, is amended to read:

17 "85-3-202. Department to review applications. (1) The
18 department shall review all applications for weather
19 modification activities, ~~and the~~. The department shall
20 prepare a report and submit it to the board with an
21 environmental impact statement prepared pursuant to Title
22 75, chapter 1, part 2. The report must contain information
23 relative to all of the criteria applicable to issuance of a
24 permit in 85-3-206. Prior to preparing the report, the
25 department shall conduct at least one public meeting in the

1 area affected by the proposed weather modification activity.
2 The department's actual costs of conducting the public
3 meeting, preparing the report, and preparing the
4 environmental impact statement must be paid by the
5 applicant.

6 (2) The board may provide by rule for exempting from
7 the license and permit requirements of this chapter:

8 (a) research, development, and experiments by state
9 and federal agencies, institutions of higher learning, and
10 bona fide nonprofit research organizations and their agents;

11 (b) laboratory research and experiments;

12 (c) activities of an emergency character for
13 protection against fire, frost, sleet, or fog; and

14 (d) activities normally engaged in for purposes
15 other than those of inducing, increasing, decreasing, or
16 preventing precipitation or hail."

17 Section 2. Section 85-3-206, MCA, is amended to read:

18 "85-3-206. Permits -- requirements and hearing --
19 public vote. (1) The permits ~~shall~~ must be issued in
20 accordance with procedures and subject to conditions the
21 board may by rule establish to effectuate this chapter ~~only~~
22 ~~if~~.

23 (2) Within 30 days after submission of the department's
24 report required under 85-3-202, the board shall hold a
25 hearing under Title 2, chapter 4, part 6, to determine



1 whether to grant, conditionally grant, or deny the
 2 application for a permit. The board may not grant or
 3 conditionally grant an application unless all requirements
 4 of this section are satisfied and the applicant establishes
 5 by a preponderance of the evidence that the following
 6 criteria have been met:

7 (a) the applicant is licensed pursuant to this chapter;

8 (b) sufficient notice of intention ~~is~~ has been
 9 published;

10 (c) an applicant furnishes has furnished proof of
 11 financial responsibility in an amount to be determined by
 12 the board as required in 85-3-211;

13 (d) the fee for the permit ~~is~~ has been paid as required
 14 in 85-3-212 and the department's costs incurred under
 15 85-3-202 have been paid;

16 (e) the weather modification and control activities to
 17 be conducted are have been determined by the board to be for
 18 the general welfare and the public good. That determination
 19 must be based on a finding of whether the operation:

20 (i) is reasonably conceived to improve water quantity
 21 or quality, reduce loss from weather hazards, provide
 22 economic benefits for the people of Montana, or advance
 23 scientific knowledge;

24 (ii) is designed to include adequate safeguards to
 25 minimize or avoid possible damage to the public health,

1 safety, and welfare and to the environment; and

2 (iii) will adversely affect another operation for which
 3 a permit has been issued.

4 (2)(3) ~~if the board determines that a hearing is~~
 5 ~~necessary, the department shall hold a public hearing in the~~
 6 ~~area to be affected by the issuance of the permit. The~~
 7 ~~department may in its discretion assess the permit applicant~~
 8 ~~for the costs incurred by the department in holding the~~
 9 ~~hearing. The board may determine not to hold a public~~
 10 ~~hearing only if, after giving notice of a hearing, no person~~
 11 ~~files a notice of intent to appear at the hearing to contest~~
 12 ~~the issuance of a permit. If no hearing is held, the board~~
 13 ~~may grant or conditionally grant a permit based on the~~
 14 ~~information contained in the application and the~~
 15 ~~department's report, provided the conditions of subsection~~
 16 ~~(4) are met.~~

17 (4) If the board decides to grant or conditionally
 18 grant a permit, the decision and all relevant information
 19 used by the board in making the decision must be submitted,
 20 in the form of a ballot measure, to the registered electors
 21 of each county over which weather modification activities
 22 will occur under the permit. A vote on whether to accept or
 23 reject the board's decision must be held in each affected
 24 county within 30 days after the board's decision. A permit
 25 may not be issued by the board unless the board's decision

SB 0072/01

1 is approved by a majority vote of all electors who vote on
2 the question.

3 (5) Costs incurred by the board in holding a hearing
4 under subsection (2), as well as costs associated with the
5 balloting required under subsection (4), must be paid by the
6 applicant."

7 **NEW SECTION. Section 3.** Effective date
8 applicability. [This act] is effective on passage and
9 approval and applies to any application for a weather
10 modification permit submitted to the department of natural
11 resources and conservation or board of natural resources and
12 conservation after [the effective date of this act] for
13 weather modification activities to be conducted in 1993 and
14 to all applications submitted for weather modification
15 activities to be conducted in 1994 and thereafter.

-End-

MINUTES

MONTANA SENATE
53rd LEGISLATURE - REGULAR SESSION

COMMITTEE ON NATURAL RESOURCES

Call to Order: By Chair Bianchi, on January 15, 1993, at 1:00 p.m.

ROLL CALL

Members Present:

Sen. Don Bianchi, Chair (D)
Sen. Cecil Weeding, Vice Chair (D)
Sen. Sue Bartlett (D)
Sen. Steve Doherty (D)
Sen. Lorents Grosfield (R)
Sen. Bob Hockett (D)
Sen. Tom Keating (R)
Sen. Ed Kennedy (D)
Sen. Bernie Swift (R)
Sen. Chuck Swysgood (R)
Sen. Henry McClernan (D)
Sen. Larry Tveit (R)
Sen. Jeff Weldon (D)

Members Excused: None.

Members Absent: None.

Staff Present: Paul Sihler, Environmental Quality Council
Leanne Kurtz, Committee Secretary

Please Note: These are summary minutes. Testimony and discussion are paraphrased and condensed.

Committee Business Summary:

Hearing: SB 60, SB 72
Executive Action: None.

HEARING ON SB 60 & SB 72

Opening Statement by Sponsor:

Sen. Devlin, SD 13, stated he preferred SB 60 and SB 72, two related bills, be heard together. He noted he originally intended to introduce just SB 72, but the Legislative Council notified him that the bill, although retroactive, would not affect Western North Dakota's application pending before the Department of Natural Resources and Conservation (DNRC). Sen. Devlin said North Dakota had a permit to seed clouds in 1990, and

withdrew the application in 1991. In 1992, North Dakota held hearings with a meteorologist which showed how the cloud seeding process works, but Sen. Devlin noted there was little opportunity for public input. The DNRC board refused to issue a weather modification permit in 1992 by a 6 to 1 vote after a hearing in Billings during which a number of people testified. North Dakota sued in Lewis and Clark County District Court to obtain the permit. Judge Dorothy McCarter ordered DNRC to issue the permit.

Sen. Devlin stated SB 72 would establish the following cloud seeding permit application process: DNRC would conduct and approve an EIS, and the public in counties over which cloud seeding flights were taking place would vote on whether or not the permit should be granted.

Sen. Devlin stated SB 60 would serve as a "total prohibition" of weather modification until there were laws in place regulating the permitting process. He noted a number of people have appeared to testify.

Sen. Devlin said DNRC representatives gave him amendments to SB 72, which they claim will take care of the pending permit. Sen. Devlin noted the Legislative Council disagrees.

Proponents' Testimony:

Jim Steinbeisser, a representative of the Montana Farm Bureau and resident of Sidney, spoke in support of both SB 60 and SB 72. He stated that the Montana Farm Bureau passed a resolution in November opposing the seeding of clouds "for the purpose of the control of rainfall by any entity." Mr. Steinbeisser discussed eastern Montana's problems with drought, noting cloud seeding has been suspected of creating or worsening droughts worldwide. He believes North Dakota's cloud seeding program is having a detrimental effect on Eastern Montana's weather, although it is a lucrative business for those involved in the seeding process. Mr. Steinbeisser concluded North Dakota does not have Montana's best interests in mind.

Mark Simonich, Director, DNRC, stated DNRC supports SB 72 and submitted written testimony (Exhibit #1). Mr. Simonich said DNRC is proposing no specific amendments, but the Department has concerns with the legislation and has been working with Sen. Devlin to find alternatives.

Sen. Tveit excused himself as a Committee member for the purposes of testifying at the hearing. He claimed to have seen DNRC's quantified amendments, and noted that he has problems with them. Sen. Tveit explained the weather modification process which occurs 10 to 40 miles inside eastern Montana "for the purposes of increasing rainfall in North Dakota." Sen. Tveit noted North Dakota seeded clouds in 1988 and 1989, but did not in 1990, 1991

and 1992. He stated there were three hearings before DNRC (1990, 1991 and 1992) and the Department denied permits all three times. Sen. Tveit described how the process works and said the five counties in North Dakota are charged 7 cents per acre for the cloud seeding service.

Sen. Tveit distributed his farm's crop records from 1988-1992 (Exhibit #2), and another farm's production report for 1989 (Exhibit #3), to show there was little or no production in years clouds were seeded. Sen. Tveit also distributed the following: a letter and petition from residents of Slope County North Dakota calling for the abolition of the Slope County Weather Modification Authority (Exhibit #4); an article from "Acres, USA" entitled "The Rain Making Myth" (Exhibit #5); and A 10/1991 "National Geographic" article entitled "Milking a Cloud for All Its Worth--Water" (Exhibit #6). Sen. Tveit used the articles to support his argument that cloud seeding has been responsible for drought, floods, cancer, air pollution, and emphysema.

Sen. Tveit discussed the dangers of silver iodide for cloud seeding and stated an Environmental Impact Study (EIS), rather than an Environmental Analysis, should be done before a permit is issued to seed clouds. He said a meteorological consultant informed him cloud seeding causes long-term draught and is not effective unless it occurs on a mountain front with updrafts.

Bernard Pease, a farmer near Lambert, described his crop yields from 1967 to 1992, linking cloud seeding to drought. Mr. Pease distributed a handout showing precipitation records from the Eastern Agricultural Research Center in Sidney (Exhibit #7), which compared cloud seeding years to non-cloud seeding years. Mr. Pease noted that he favored both SB 60 and SB 72.

Jim Jensen, Executive Director of the Montana Environmental Information Center (MEIC) expressed support for SB 60 and SB 72. He claimed DNRC has not complied with the Montana Environmental Policy Act (MEPA) in this case. He said DNRC should have done an EIS and provided communities affected by cloud seeding with information on its consequences. He added DNRC should have had enough information to prepare a better defense in district court. Referring to SB 60, Mr. Jensen stated that the science on both sides of the cloud seeding issue is "murky" and a wasted effort. He noted the legislature should direct DNRC to stop spending money on the issue of cloud seeding.

Helen Waller, a McCone County farmer and rancher, said she prefers SB 60 over SB 72, but noted at least SB 72 required an EIS. She stressed DNRC should never be allowed to ignore a serious review of the impact of weather modification. Ms. Waller added Environmental Analyses are inadequate, and discussed the costs involved in conducting an EIS and the costs of the permit process.

Doris Waller, a farmer and rancher from Circle, submitted a

prepared statement to the Committee (Exhibit #8).

Lynn Householder, resident of Ismay, noted the witnesses for SB 60 and SB 72 represent the whole eastern side of Montana. He submitted a letter from Charles Casey to the Board of Natural Resources opposing issuing North Dakota cloud seeding permits (Exhibit #9). Mr. Householder discussed rainfall in Eastern Montana, and said he knows many people who have died from cancer in the Ismay area.

Ralph Bruski, a rancher from Ekalaka, said he doesn't want his rainfall benefitting North Dakota. Mr. Bruski said cloud seeding is not an exact science, and linked it to cancer and multiple sclerosis. He said he favors SB 60 over SB 72, but supports both bills.

Sen. Bruski-Maus, SD 12, said her District contains five counties, three of which border North Dakota. She recommended a Do Pass for either SB 60 or SB 72.

Sen. Weeding stated he wanted to be listed as a proponent of both SB 60 and SB 72, noting he would save his remarks for executive session.

Opponents' Testimony:

Mark Simonich, Director, DNRC, submitted written testimony expressing DNRC's opposition to SB 60 (Exhibit #10). He added DNRC understands the concerns of Eastern Montana residents and their concerns should be considered in the permitting process.

Questions From Committee Members and Responses:

Sen. Doherty asked Mr. Simonich if amendments which DNRC envisions for SB 72 would require an applicant to pay for an Environmental Analysis (EA) as well as an EIS. Mr. Simonich stated the legislation is written to ensure that applicants pay for whatever analysis is done.

Sen. Doherty wondered who made the decision not to conduct an EIS on North Dakota's permit, and asked for the Department's response to Jim Jensen's testimony which asserted DNRC did not comply with MEPA.

Wayne Wetzel, Deputy Director, DNRC, said the Weather Modification Act was passed before MEPA and North Dakota applied for a weather modification permit the first time in 1977. He said the Department conducted a Preliminary Environmental Review (PER), which was equivalent to an EA, but did not include public involvement. Mr. Wetzel said the PER showed weather modification had no significant impact on rainfall. He added that in 1989, the Department "reissued" its PER and found diminished rainfall

in North Dakota and Montana, but couldn't confirm it was due to weather modification. He said the Department had not complied with MEPA in 1989 when it reissued the PER, as the rules had changed in 1988. Mr. Wetzel added the Department was remiss in not conducting an EA or an EIS at that time.

DNRC sent a letter to North Dakota saying the Department could not process its application until it complied with MEPA. The Department estimated it would cost \$20,000 to determine whether cloud seeding resulted in diminished rainfall in eastern Montana. Mr. Wetzel said North Dakota had agreed to fund the study.

Sen. Doherty asked Sen. Devlin which bill he would rather have passed. Sen. Devlin said he preferred SB 60, because it heads off North Dakota's application for the Summer of 1993. He said Greg Petesch told him SB 72 might not stop the application.

Sen. Doherty wondered if prohibiting weather modification (the intent of SB 60) would be interfering with a private company's right to do business.

The Committee and Mr. Wetzel discussed how snowmaking by ski areas compares to weather modification.

Sen. Hockett stressed this is not just an Eastern Montana issue and asked if Montana is seeding clouds in Idaho. Sen. Devlin said he did not know. He added if North Dakota's application were not pending, he would not have introduced SB 60. Sen. Devlin said amendments suggested by DNRC are unacceptable.

Sen. Devlin discussed placing a sunset date on SB 60, and allowing SB 72 to become effective for the next permitting year.

Sen. Kennedy asked about the possibility of a lawsuit regarding the pending application. Don McIntyre, chief counsel, DNRC, stated North Dakota has not paid any funds that would have to be refunded if SB 60 passed. He added the only potential lawsuits would involve challenging the constitutionality of the act.

Sen. Tveit commented that proponents of SB 60 and SB 72 simply want to keep the cloud seeders out of Montana. The North Dakota businesses are ongoing and could continue to operate in their own state. He noted SB 72 specifies the Board of Natural Resources must work for the benefit of the people of Montana.

Mr. McIntyre said Judge McCarter's decision was based on her belief that most of the credible evidence favored North Dakota. He said the board was hesitant to follow her order, so she issued a second order directing the board to grant a permit. Mr. McIntyre said if SB 72 passed, DNRC would be required to conduct an EIS. He added SB 72 "clearly sets out what the public interest criteria are," resulting in a sounder decision making process.

Mr. McIntyre said he believes SB 72 could apply to North Dakota's pending application if the bill had a retroactivity clause. He said he wasn't sure if the voting provision could be made retroactive.

Chair Bianchi asked Mr. McIntyre and the Legislative Council to reach an agreement on what is legal and permissible in SB 72 before the Committee takes executive action.

Sen. Swysgood asked for clarification of the difference between SB 60 and SB 72 with a retroactivity clause. Mr. McIntyre replied SB 72 keeps the regulatory program in place, so the applicant can proceed under the new law. He said SB 60 is a clear prohibition, and the agency would have to stop action.

Sen. Devlin said SB 60 "wipes out the whole law," so any permits pending would be cancelled.

Sen. Keating commented with the money involved in cloud seeding, it may be worthwhile for a business to challenge the retroactive applicability in court.

Mr. McIntyre said he doubts North Dakota would challenge the retroactivity of SB 72, and added the state could challenge SB 60 on the grounds it had an application pending. He said North Dakota could also challenge the bill on the basis that it would be interfering with interstate commerce. He said one issue is whether or not atmospheric water is an article of commerce.

Sen. Devlin said scientific experiments could be excluded from the prohibition in SB 60 if the people in the area agree. He noted the people should come before anything else.

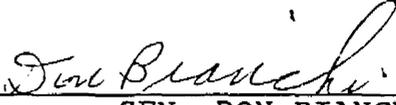
Mr. Fritz said DNRC has never promoted weather modification in Montana. He added DNRC has been able to find no evidence that "what North Dakota wants to do will harm Montana." He suggested it might make more sense for out-of-state entities to bring their proposals to the Legislature, rather than preclude the possibility of beneficial use of weather modification in Montana.

Closing by Sponsor:

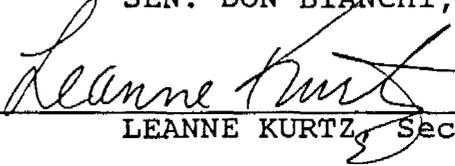
Sen. Devlin said he fears people might start shooting at airplanes. He asks the Committee to pass SB 60, sunset it in a year and allow SB 72 to take effect.

ADJOURNMENT

Adjournment:



SEN. DON BIANCHI, Chair



LEANNE KURTZ, Secretary

DB/lk

LEPO

Legislative Environmental
Policy OfficeMONTANA LEGISLATIVE
SERVICES DIVISION

REGIONAL WEATHER MODIFICATION LAWS

MONTANA LAWS DO NOT MIRROR NEARBY STATES

A survey of the laws of Montana's neighboring states suggests these states have less-restrictive laws, allowing for various weather modification, or cloud-seeding, projects. The Water Policy Interim Committee requested this review at their January 2020 meeting. The review includes a look at the laws, rules, and programs in six states (Montana, Colorado, Idaho, North Dakota, Utah, and Wyoming). This review also looks at federal laws related to weather modification and at the major, privately funded, cloud-seeding project in Alberta.

Weather modification techniques were developed in the United States in the 1940s. The Montana Legislature passed its first weather modification laws in 1967.

The primary technical process that enables cloud seeding is the injection of silver iodide into a cloud under certain atmospheric conditions. Some research shows cloud seeding increases hydrological output in basins and reduces the size and severity of hailstorms. Others, however, claim that cloud seeding is akin to "cloud rustling," and decreases downwind precipitation.

Due to concerns primarily from eastern Montanans about cloud seeding in western North Dakota, the 1993 Montana Legislature passed laws that were more restrictive on weather modification, including increased environmental and public meeting requirements. Senate Bill 72 (1993) requires a permit applicant to provide an environmental impact statement, host a public meeting, and provide \$10 million proof of financial responsibility (in bonds, insurance, negotiable securities, cash, etc.) for unanticipated damages.

Since the passage of SB72, the Montana Department of Natural Resources has issued no weather modification permits. But in nearby states, the regulatory landscape is much different. Laws and policies in these states appear to encourage research and use of weather modification. Some state-supported projects cover large areas of these states. In others, weather modification projects are conducted by locally created districts or private companies. This review summarizes these differences.

State/entity	Authority	License/permit requirements	Exemptions and add'l authorities	Extent of program
Montana	<p>Atmospheric Weather Modification Act (first passed in 1967), administered by Department of Natural Resources and Conservation. Weather modification defined "as changing or controlling or attempting to change or control, by artificial methods, the natural development of atmospheric cloud forms or precipitation forms that occur in the troposphere."</p>	<p>Annual license required for those with competence in field of weather modification. \$100 fee. Licensed applicant must receive permit for each operation annually in one geographic area. Permit requirements includes fee (1% of operation cost), \$10 million proof of financial responsibility to meet "the applicant's ability to respond in damages for liability that might reasonably be attached to or result from the applicant's weather modification and control activities," environmental impact statement (EIS) prepared by department, a public meeting, and publication of notice of intention to conduct weather modification operation.</p>	<p>Department may exempt research and experiments. County electors may petition for creation of county weather modification authority.</p>	<p>No permits issued since 1993.</p>
Alberta				<p>Multiple insurance companies formed the Alberta Severe Weather Management Society in 1996 to combat repeated, destructive hail within the province's "Hailstorm Alley." The society contracts with a private firm to conduct the aerial-based project, which is estimated to cost \$5 million annually.</p>

State/entity	Authority	License/permit requirements	Exemptions and add'l authorities	Extent of program
Colorado	<p>Weather Modification Act of 1972 requires director of Department of Natural Resources to create rules. Director may delegate Colorado Water Conservation Board to administer act. Under the act, "the state of Colorado claims the right to all moisture suspended in the atmosphere which falls or is artificially induced to fall within its borders." Weather modification defined as "any program, operation, or experiment intended to induce changes in the composition, behavior, or dynamics of the atmosphere by artificial means."</p>	<p>Permit required for each weather modification operation. Operators must meet qualifications, education, and experience requirements and provide required information. Fees include a permit fee (at least \$100); commercial operations pay an additional commercial fee (2% of yearly contact between permit holder and operation sponsors.) Proof of financial responsibility must be a liability policy of at least \$1 million or three times the value of the weather modification operation. Before the department issues a permit, a public hearing must be held. Applicants must publish a legal notice of intent in affected counties and notify the National Weather Service, Colorado Avalanche Information Center, county emergency managers, the Colorado State University's Colorado Climate Center. Permit holders must supply yearly operational plans, daily logs, annual reports, and records for aircraft-based operations. Permits may be suspended due to certain snowpack conditions, avalanche hazards, and weather hazards. Unpermitted weather modification activities without a permit are subject to a felony charge; failure to meet permitting requirements are subject to misdemeanor charge.</p>	<p>Department may exempt certain research, development, experiments, or emergency protection activities for fire, frost, hail, sleet, smog, fog, or drought.</p>	<p>The department has permitted 8 programs across the state, including river basins, agricultural areas, and ski areas by ground-based generator and aircraft.</p>

State/entity	Authority	License/permit requirements	Exemptions and add'l authorities	Extent of program
Federal government (U.S.)	Congress passed the Weather Modification Reporting Act of 1972 and the National Weather Modification Policy Act of 1976 requiring non-federally sponsored weather modification activities to report their doings to the Commerce Department .	None. This is a reporting requirement to the National Oceanic and Atmospheric Administration before, during, and after weather modification activities. The report must include the date of the activity, purpose, modification agents used, and method employed.		
Idaho	Water Resources Division director shall "develop, coordinate, and provide...for weather modification projects involving cloud seeding that are designed to increase the water supplies of the state by enhancing natural precipitation and which conform to state water planning objectives."	No permitting requirements , however, anyone conducting weather modification must file "a log of all its activities in the production, artificially, within the state, of rainfall" to state Department of Agriculture.	After a petition of real property holders, a county commission may hold elections to establish a weather modification district. The district may levy taxes to conduct weather modification activities. Water districts may authorize weather modification projects involving cloud seeding. And the state water resources board and private entities may fund their own projects.	Locally formed districts and private entities (like Idaho Power Co.) fund various projects across state.
North Dakota	State laws states "all water derived as a result of weather modification operations shall be considered a part of North Dakota's basic water supply..." North Dakota Atmospheric Resource Board administers weather modification program, including licenses, permits, standards, instructions, contracts, research and enforcement.	Annual, \$50 license required of competent applicants. Annual, \$25 permit required for each geographic area of operations. Applicant must provide an operational plan and furnish proof of financial responsibility of 5 times the value of an operation under contract or 5 times the cost of an operation not under contract. Performance or bid bonds may be required. Objection to permit may trigger a public hearing .	Weather modification authorities may be created (or abolished) by various petition methods, vote of the public, or a vote by a county commission. A county commission may use general fund levy taxes to pay for authority activities.	Board's major project is North Dakota Cloud Modification Project that seeds clouds for hail damage reduction and rain enhancement across all or parts of six western counties.

State/entity	Authority	License/permit requirements	Exemptions and add'l authorities	Extent of program
Utah	<p>The 1973 Cloud Seeding Act states that "all water derived as a result of cloud seeding shall be considered a part of the natural water supply of the basin in the same sense as if no cloud seeding operations had been conducted..." The Utah Division of Water Resources administers much of the act; administrative rules allow for input and recommendations from the Utah Board of Water Resources and the Weather Modification Advisory Committee (if created).</p>	<p>Cloud-seeding contractors must register with the Division of Water Resources. The act required an applicant to meet established qualifications and submit proof of financial responsibility "to give reasonable assurance of protection to the public in the event it should be established that damages were caused to third parties as a result of negligence in carrying out a cloud-seeding project." (Amounts do not appear in law or rule.) Permit applicants must also submit contacts, operation plans, and file notice of intention for publication for each county where the operation is to be conducted.</p>	<p>Division of Water Resources must authorize cloud-seeding research, however fog suppression, frost prevention for orchards and crops are excluded from the act. The act also states that cloud-seeding is "not presumed to constitute trespass or nuisance."</p>	<p>The division funded more than \$500,000 across 7 projects areas in basins across the state, which represents approximately 50 percent of the cost of the projects.</p>

State/entity	Authority	License/permit requirements	Exemptions and add'l authorities	Extent of program
Wyoming	State law says "the state of Wyoming claims its sovereign right to the use for its residents and best interests of the moisture contained in the cloud and atmosphere within its sovereign state boundaries."	The state engineer issues a separate permit for each "experiment or activity." An applicant must demonstrate adequate qualifications in atmospheric sciences and pay a fee of no more than \$100. A permittee must send a written report to the state engineer.	The state engineer may encourage and/or spend funds for weather modification activities.	The Wyoming Water Development Office manages two projects in the Wind River Mountains, and in the Medicine Bow, Sierra Madres, and Laramie mountain ranges. The ground-based Wind River project was appropriated \$460,000 in 2019, including funds from the state of Wyoming, Southern Nevada Water Authority, Central Arizona Water Conservancy District, Colorado River Board of California, and various Wyoming-based entities. The aerial-based project cost for the Medicin Bow/Sierra Madre/Laramie project was \$634,000 for the 2019-20 winter.

Disclaimer

The summary was produced as part of the 2017-18 Water Policy Interim Committee's work plan for its House Joint Resolution 40 study. This summary of regional laws related to weather modification is neither exhaustive nor complete.

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North Dakota Atmospheric Resource Board, <http://snc.nd.gov/arb>.

Title 36, chapter 20, Administrative Rules of Montana.

Title 36, article 20, Colorado Revised Statutes.

Titles 22, 42, and 46, Idaho Statutes.

Title 85, chapter 3, Montana Code Annotated.

Title 73, chapter 15, Utah Code.

Utah Administrative Code.

Utah Division of Water Resources, *Utah Cloud Seeding Program: Increased Runoff and Cost Analyses*, 2018.

Wyoming Water Development Office, *Wyoming Cloud Seeding Activities*, 2019.

Future Water Committee

Water Policy Committee

AGAI Public Comment on HJ 40 – Proposed Bill Draft PD 0006

To: Water Policy Interim Committee

From: AGAI

RE: PD 0006

Date: 8/27/2020

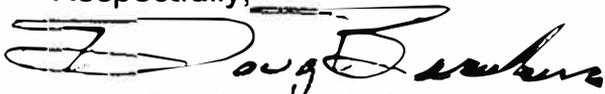
AGAI strongly supports the proposed policy on weather modification outlined in PD 0006. The Gallatin Valley is seeing continued extensive growth. In addition to development pressures, AGAI's irrigator members are facing challenges with shifting seasons due to earlier warming and earlier runoff of our historic snow pack.

The ability to work with our neighbors to coordinate weather modification activities along with developing off stream storage is critical to the future of agriculture in the Gallatin.

PD 0006 proposes a reasonable process that provides environmental safeguards while still allowing for projects to move forward in a responsible manner. The economic return to Montana's businesses is significant with the ability to store water in snow in higher elevations, develop other storage options, and reduce hail damage to our agricultural crops, homes, and businesses.

Please introduce PD 0006 as a committee bill in the 2021 Legislative Session.

Respectfully,



Doug Braaksma, Chairman
Future Water Supply Committee

The mission of the Association of Gallatin Agricultural Irrigators is to be the guardian and advocate of the Gallatin River System through the protection of its historically decreed water rights.

WATER POLICY INTERIM COMMITTEE
Room 172, State Capitol Building
September 14-15, 2020
Public Comment
Jim Hagenbarth

These comments pertain to the Committee's analysis of weather modification asked for via HJ 40 and the related weather modification legislation (PD0006).

The information submitted to the Committee on weather modification was all inclusive from outlining previous legislative history, past uses in Montana, 1993 restrictive legislation, and an understanding of the current technology practiced by many surrounding states and its efficacy. As evidenced by the footnotes in the report the committee and staff gained an understanding of the past, present and potential future of cloud seeding in the state. This report was well done and will certainly enlighten the legislature on the sight specific potential of increasing precipitation for the benefit of all users and abating damage in susceptible areas. Water is our most precious commodity and Montana is missing an opportunity to benefit from the moisture laden clouds that often pass us by.

With the benefit of this study the Committee has drafted legislation that will again precipitate Montana's ability to take advantage of this beneficial tool. PD0006 was based off the original weather modification legislation with changes made to reconcile the negative impacts of the 1993 legislation and reflects the benefits of improved cloud seeding technology. It allows any qualified entity to participate, requires only a license, and an environmental assessment similar to an activity with little environmental impact. The department adopts rules to ensure the participating entity meets stringent qualifications, responsibilities and develops suspension guidelines to limit risk and liability. The license requires a full disclosure of the entities involved, purpose, time periods, areas and materials used. A notice of intention must have published public notice and applicant must provide proof of insurance. Termination clauses are included along with yearly operation records and reports. This legislation is adequate, has safeguards, is transparent and will allow entities to develop site specific applications of weather modification technology for the benefit of all water users. Additional snowpack in our mountains has the greatest potential impact. I thank the Committee and staff for their diligence in studying and understanding weather modification.

From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Tuesday, September 08, 2020 1:20:51 PM

Comments for WPIC

Date: 8th September 2020 13:20

Full Name:
Daniel Drummond

Email Address:
daniel.drummond@umconnect.umt.edu

Subject Line:
HJ-40

Your Comment:
Even though cloud-seeding is relatively harmless to the environment, I do not think it is right for humans to mess with the environment besides to stop the climate frok changing at the rate at which it is currently.

Sent via www.leg.mt.gov/committees/interim/2019wpic/meeting-info/

From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Tuesday, September 01, 2020 10:33:42 AM

Comments for WPIC

Date: 1st September 2020 10:33

Full Name:
Gabriella Eaton

Email Address:
gabriellane22@gmail.com

Subject Line:
HJ40

Your Comment:

To whom it may concern, After reading the HJ40 report on seeding clouds, I am left with a few questions and thoughts to share. I am curious as to why climate change wasn't mentioned at all in this report? In my experience in learning about cloud seeding, it has been discussed on whether its' use in the context of climate change is ethical for a few reasons. By using technological modifications to our atmosphere and local climates, we may ignore the need for behavioral change on a systemic scale in the context of global climate change. Greenhouse gas emissions cause possible increases in storm intensity and increased temperatures which overall could cause a reduction in annual water availability and snowpack decreases. The use of cloud seeding to reduce these symptoms we may experience due to global climate change seems like a short term solution to a complex global problem that isn't currently being addressed in the US on a national level. Solutions like cloud seeding should only be used as a last resort. This topic sheds light on an important question. Who owns the atmosphere and therefore has the right to change it? Who gets to reap the benefits of cloud seeding? Most likely wealthier communities and countries will reap the benefits and we will further inequality in the US and around the world. The atmosphere doesn't have borders and we don't really know the long term impacts of spraying silver iodide into the atmosphere. Will it have negative impacts on some communities while benefiting others? Right now the way to address issues of increased severe weather, drought, and other climatic consequences is to implement climate adaption and mitigation in the US and as a global community. Thank you for your time, Gabriella Eaton

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Wednesday, September 02, 2020 11:07:10 PM

Comments for WPIC

Date: 2nd September 2020 23:07

Full Name:

Grayson

Email Address:

graysond.henshaw@gmail.com

Subject Line:

HJ40

Your Comment:

What are the consequences of controlling and manipulating the Earth's natural rain cycle? What are the consequences of heavy metals that fall into our water supply, crops, and even seep through the skin? How does this interact with HAARP and EMF frequencies? Weather modification can be a deadly weapon in the wrong hands.

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Monday, August 31, 2020 9:12:58 PM

Comments for WPIC

Date: 31st August 2020 21:12

Full Name:

Bowman Leigh

Email Address:

bowmanleigh@gmail.com

Subject Line:

HJ40 Study - Weather Modification (Cloud Seeding)

Your Comment:

To the Members of the WPIC, After reading the HJ40 draft report, "A Study of Weather Modification," I am struck by the lack of conclusive scientific evidence indicating the safety of using silver iodide and dry ice in weather modification techniques. While, based on the report, statistical evidence points to "success" in terms of increase in snowfall, the environmental impact of these techniques is left uncertain. Considering the importance many Montanans assign to maintaining healthy ecosystems, particularly when it comes to tourism, recreation, etc., providing compelling evidence that these methods are environmentally-friendly is, I believe, necessary for public buy-in to this bill. I urge you to take the necessary precautions to ensure that weather modification does not harm Montana's ecosystems for the sake of increased precipitation. Thank you for your consideration, Bowman Leigh

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Monday, August 31, 2020 10:57:10 PM

Comments for WPIC

Date: 31st August 2020 22:57

Full Name:

Callie Ling

Email Address:

kookykaleidoscope720@gmail.com

Subject Line:

Weather modification

Your Comment:

What are some poor side effects of cloud seeding? Will "seeding" more water and snow and reducing hail have an affect on the overall weather system outside of the targeted area? Also is shooting silver iodide into the air safe in the respect of chemical balance?

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Tuesday, September 01, 2020 12:31:09 AM

Comments for WPIC

Date: 1st September 2020 00:31

Full Name:
Sam Mothner

Email Address:
sammothner@gmail.com

Subject Line:
HJ40

Your Comment:

I think that cloud seeding is a smart way to help with the availability of water year round but I do have a few questions. first, what is the affect of putting silver iodide in the atmosphere? Also, how would too much precipitation be managed? Could this lead to increased flooding in the spring with runoff? Would there be a public notice before there was cloud seeding done? Would scientific reports and studies be available to the public so they can see that it is not "chemtrails"?

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Monday, August 31, 2020 10:30:55 PM

Comments for WPIC

Date: 31st August 2020 22:30

Full Name:
Stephanie Nikkila

Email Address:
SteffiNikkila@gmail.com

Subject Line:
HJ40: Seeding Clouds

Your Comment:

I think this is a real interesting idea. However, does this make humans the "Gardeners of the Earth" rather than it's humble citizens? Is this potentially crossing a line we can't come back from?

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Monday, August 31, 2020 1:30:35 PM

Comments for WPIC

Date: 31st August 2020 13:30

Full Name:
Timothy Seegraber

Email Address:
Tseegraber@gmail.com

Subject Line:
Altering Weather with Science

Your Comment:

Members of WPIC, I believe that the "seeding of clouds" is a revolutionary idea and if implemented properly will reap many benefits in future years to come. I do have some concerns for the project however. According to the HJ 40 it does not state that there has been very many experiments or practical test runs put into the technology thus far. I also have a hunch that once this idea if more publicized there will be backlash from individuals who believe creating weather is unethical. From my points of view, as long as the substance is safe (as silver iodide is) there is no problem with implementing it. The fact that the DNRC has strict guidelines for those attempting to acquire a license and a permit is also a good sign. Although more scientific trials and studies should go through before any permits are given out. With proper planning and implementation tactics I believe this could be a great resource for our state. Thank you very much.

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From: webmaster@localhost.legmt.gov
To: [Mohr, Jason](#)
Subject: Public Comment Submission for WPIC
Date: Monday, August 31, 2020 9:11:28 PM

Comments for WPIC

Date: 31st August 2020 21:11

Full Name:

Mak Sisson

Email Address:

makenziesisson@gmail.com

Subject Line:

Concerns on Water Rights for HJ 40

Your Comment:

I have concerns for the legality and ethics of the proposed plans to attempt seeding clouds. The point of seeding clouds is to induce a sort of control over the natural hydro-logic processes that govern water in the west. This is admirable, especially considering the shrinking supply of available freshwater for commercial and industrial use. We need to be looking towards solutions for this problem, which is coming very fast, and has no easy fix. However, I do worry about the ethics of this process. If a group can gain the right to seed these clouds through purchase of a license and were able to convince the DNRC that their use would be viable and beneficial for Montanan citizens, could they gain a power that could harm the citizens of another state, who may lose out on the rainwater that was just seeded for Montanans? What mandates a "knowledge of meteorology" required for a license? How large are the geographical areas that one covers with a single seeding? With any attempt to control water and alter its flow, whether on the ground or in the air, there is always the fear of removing a resource from an area that depends on it. I hope this will not be the case, but I worry for the case that could be brought against this practice.

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