

## New

Ministry

Agriculture and Irrigation

### Describe: Basic Job Details

#### Position

Position ID

Position Name (30 characters)

Mgr Agricultural Meteorology

Requested Class

Manager (Zone 2)

Job Focus

Operations/Program

Supervisory Level

01 - Yes Supervisory

Agency (ministry) code

Cost Centre

Program Code: (enter if required)

#### Employee

Employee Name (or Vacant)

#### Organizational Structure

Division, Branch/Unit

Primary Ag, Natural Resource Mgmt, AgMet

Current organizational chart attached?

Supervisor's Position ID

Supervisor's Position Name (30 characters)

Dir. Natural Resource Analysis

Supervisor's Current Class

### Design: Identify Job Duties and Value

#### Job Purpose and Organizational Context

Why the job exists:

This complex provincial position is responsible for all aspects of Alberta's near-real time hourly agriculture climate station network and the Alberta Climate Information Service (ACIS), which is Alberta's integrated suite of applications allowing Albertans to see and query weather and climate data.

This sophisticated meteorological network supports a wide range of stakeholders, polices, and programs. For example:

1. The Government of Alberta relies on the high-quality data to support the Alberta Financial Services Corporation moisture related crop insurance programs,
2. The GoA uses the Climate and Atlas Maps to support Alberta's Drought and Excessive Moisture Advisory Group.
3. Alberta farmers use the decision support tools to manage insect pests, crop diseases, and schedule irrigation.
4. Alberta municipalities base fire permits and restrictions using the fire indices data.

#### Responsibilities

Job outcomes (4-6 core results), and for each outcome, 4-6 corresponding activities:

Outcome 1: Leadership and coordination of planning, development, and effective delivery of weather

## **data and ACIS including all related stations, applications, models and reporting functions.**

- Ensure stations meets or exceeds World Meteorological Organization Standards and client needs. This includes data feeds from other agencies.
- Expand the meteorological network in areas of low density increasing the number of insured acres province wide.
- Investigate/research and develop new derivatives and products that use plus complement meteorological data and serve the agricultural industry.
- Manage and interpret climate data.
  - Characterize and interpret Alberta's climate data, extending over more than 140-years of observations, to understand Alberta's climatic variability.
  - Develop or adopt models to create online decision support tools and data products such as irrigation scheduling, agro-meteorological indices, fire indices, pest models, water balance/use estimates, etc.
  - Understand and operate all models including the soil moisture model.
- Develop, enhance, and operate software and computer systems for the following:
  - Warehousing and storing vast amounts of climate data that grows daily.
  - Quality control systems and specialized algorithms for data processing.
  - Managing, assembling, and amalgamating historical meteorological data sets from several agencies into a usable, transparent, and distributable formats.
  - Soil moisture modelling and verification protocols.
  - Enhance the stability of ACIS and the suite applications.
- Develop and provide critical data and reports for the Government of Alberta and the Alberta Financial Services Cooperation's (AFSC).
  - Development and enhancement of the Drought and Excessive Moisture Advisory Group, and the associated risk management plans.
  - Advise the ministry of impactful weather trends and events.
  - Analyze data and report during extreme meteorological conditions.
  - Provide data to support all AFSC moisture related crop insurance programs including dryland, irrigated, and pasture. Data underpinned \$750 million of crop insurance during the 2023 crop year.
  - Provide expert advice and guidance in the development of weather-related crop insurance programs.
- Supply climate data to a variety of end users:
  - Supply near real time quality controlled data feeds to “power” end users in the form of RSS data feeds. Includes companies, agencies, academics, and individuals.
  - Online, information is available for a wide variety of users ranging from the public to large corporations and other Government agencies.
  - Fulfill large data requests to organizations seeking meteorological data and data products.

## **Outcome 2 Network and Partnership Development**

- Initiate and support the development of provincial and federal partnerships with government and industry stakeholders to support the ongoing development, use and expansion of weather networks.
  - Provide advice and technical expertise for the development of weather networks and their applications at the provincial and national level.
  - Work with EPA and FP to provide data feeds and other products that support ongoing operations for flood and fire forecasting and emergency management.
  - Development and maintenance of the MOU with AFSC.
- Ensure comprehensive partnerships and networks for better information to support policy research and analysis, decision support systems, risk management tools, weather-based programs and understanding of climatic effects on agricultural production and climate adaptation.
- Identify partner, client and stakeholders needs to develop solutions.

## **Outcome 3 Effective coordination, preparation, and delivery information in a variety of formats and mediums for Executive Leadership, stakeholders, and clients.**

- Work with other team members to develop and deliver information including weekly weather and

moisture situation releases, special reports, media, and other extension materials.

- Analysis and reporting of extreme conditions as they occur and ensure information is sent to a variety of stakeholders.
- Respond to media requests (radio, print, television, etc.)
- Provide regular reports to Executive Leadership.

#### **Outcome 4 Effective Financial and Human Resource Management**

- Manage a combination of professional and technical staff across Alberta.
  - Work planning, performance measurement/progress measurement, and evaluation to ensure progress towards objectives and goals, and to ensure continuous improvement.
  - Knowledge management to ensure information is shared and readily accessible.
  - Staff management, recruitment, and coaching to support program implementation.
  - Lead team meetings to facilitate effective planning, communications, and knowledge management.
- sent to a variety of stakeholders.

#### **Problem Solving**

Typical problems solved:

This position applies a diverse knowledge base across multidisciplines to address complex scenarios. The disciplines include soil physics, watershed management, agronomy, meteorology, statistical analysis, website design, experimental design and analysis, and computer science including programming, modeling, and geographic information systems.

Moisture available for crops must be determined and reported based on metrics collected at climate stations. This position must be able to use soil moisture deficits or excesses, model plant/soil/atmosphere interactions, monitor drought indices, apply climate derivatives, develop, or use software and databases, plus understand land management practices and soil property relationships to determine the moisture situation within the agriculture zone in Alberta.

This position is responsible to identify moisture and climate risks in Alberta. A sound knowledge of Alberta meteorological past will be used to put current events into historical context. A variety of tools and techniques will be used to deeply explore Alberta's climate data sets. Must understand historical data collection techniques, land use changes and urban influences on meteorological time series must be factored into understanding long time series of meteorological observations.

Types of guidance available for problem solving:

The work conducted follows World Meteorological Organization standards and regularly reads and reviews research from around the world. This includes technical information from both national and international agricultural and environmental developments that may affect Alberta.

Day to day activities have been documented as a set of procedures. In addition, the staff reporting to this position have knowledge of some of the practices, procedures, and guidelines.

Direct or indirect impacts of decisions:

This self-managed position contributes climate, drought and soil moisture information that is used for a wide variety of purposes within the GoA, Alberta, and Canada. It identifies soil moisture and climate risks for the agriculture industry. It recommends strategies, policy and program options to address emerging soil moisture and climate data issues or problems.

- Agriculture Financial Services Corporation (AFSC) uses the data for their insurance programs. In 2023 more than \$750 million of crop insurance was underpinned by the data collected and reported to AFSC.
- Executive leadership including the Minister use the data collected and the reporting products produced to make decision about drought or excessive moisture situations across Alberta.
- The Drought and Excessive Moisture Advisory Group uses the data and reporting products to advise members of actions to take or programs to implement to help farmers during drought or excessive moisture, extreme heat, and extreme cold events.

- Rural Municipalities use the information to make decisions regarding flood or excessive moisture plus use the daily maps to inform their fire permitting process.
- Media relies on the information for excessive moisture or drought situation updates and the interpretations on the impact to agriculture in Alberta.
- Agriculture commodity associations use the data to assess the impacts of the weather and climate situation on their farmer members. This allows them to advocate for their members and develop supports.
- Information is relied on by other GoA groups to develop policies or react to critical situations.
- Academia, research agencies, and private industry rely on the data and reporting products for input into their projects and for decision making.
- Interpolated data is by a variety of agencies and individuals to model and or understand the impacts of historical weather patterns on a variety of weather affected scenarios.

## Key Relationships

Major stakeholders and purpose of interactions:

### Internal to Ministry

- Staff - Daily basis. Discuss data, collection of data, models, presentation of information, the Alberta Climate Information Service, and plan day to day activities.
- Communication Group - Weekly. Reports are developed weekly and placed online.
- Section and Branch staff and management - Daily. Complete budgeting, contracts, network expansion, climate data, climate situation, and reporting the moisture situation in Alberta. Other products and tools rely on the data including irrigation management modelling.
- Service Alberta and Technology and Innovation - Weekly. Software development, implementation, issues, and data management.
- Other Branches - weekly. Assist with crop reporting on a weekly basis during the growing season.

### External to the Ministry.

- AFSC - weekly. To provide soil moisture models, quality-controlled data, weather data and derivatives, and maps.
- Ministry responsible for Environment - weekly. To provide emails with their stations needing attention, help with data management, provide data for flood forecasting, and help with their station siting.
- Ministry responsible for Forestry - weekly. They use the situation report and when needed special maps and analysis are provided to describe adverse weather events.
- Meteorological Services of Canada - as needed. Communicate to exchange information on meteorological network operations.
- National Agroclimatic Information Service - weekly. Provide climate data, modelled information, climate derivatives, and drought indices.
- Emergency Management Alberta - provide situational awareness as needed Bi-annually. Weather data.
- Universities - as needed. Provide data sets and expertise with respect to the nature and reliability of meteorological records in various regions of the province and inform as to the data reliability and quality of several different meteorological networks and stations operating across the province.
- Media (radio, television, print) - weekly. Weather information and updates during adverse weather stations for agriculture or updates on seasonal trends.
- Agriculture and Agri-Food Canada - weekly. Provide climate data, modelled information, climate derivatives, and drought indices.
- Agriculture commodity associations and consultants. - Monthly. Fulfill data requests, assist with special projects, provide weather data, derivatives, and interpretation of the information.
- Municipalities - Monthly. Fulfill data requests, provide general information, and work to site new stations.

## Required Education, Experience and Technical Competencies

Education Level

Master's Degree

Focus/Major

Science

2nd Major/Minor if applicable

Engineering

Designation

Other

If other, specify:

**Professional Agrologist.**

Job-specific experience, technical competencies, certification and/or training:

- Management and leadership of a large diverse group of employees, extensive physical resources, complex IT systems and the delivery of results in a complex technical area.
  - Project management experience: proposal development, experimental design, implementation, data analysis and reporting.
  - Experience developing drought, climate, and soil moisture research projects.
  - Complex problem-solving skills.
  - Skills to gather, validate and interpret both primary and secondary data sources. Ability to effectively integrate information, knowledge, and solutions.
- M.Sc. in agriculture sciences or meteorology that includes a thorough knowledge of soils, soil management, land, and agronomic sciences. This must include their interactions, issues, and problems.
- Knowledge of current and emerging agricultural trends, agricultural systems, environmental issues, and agri-environmental interactions.
- Expert knowledge of drought monitoring, drought impacts on agriculture, and soil moisture measurement and soil water dynamics relevant to drought and drought risk.
- Experience with designing, developing, and implementing models to define drought indices soil plant atmospheric interactions.
- Advanced knowledge of drought indices, modeling of drought and soil moisture, analysis and interpretation of soil, crop and climate data and the measurement of soil moisture,
- Analytical skills are applied to both quantitative and qualitative applied research projects.
- Thorough knowledge of computer science and programming.
- Strong computer skills related to data, database management, spatial databases, and graphics.
- Experience with GIS programs.

Weather data experience designing, developing, and implementing:

- Quality assurance and control systems.
- Network resource management tools.
- Statistical analysis (SAS)
- Mathematical and computer modelling

**Behavioral Competencies**

Pick 4-5 representative behavioral competencies and their level.

Competency	Level					Level Definition	Examples of how this level best represents the job
	A	B	C	D	E		
<b>Systems Thinking</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<b>Integrates broader context into planning:</b> <ul style="list-style-type: none"> <li>● Plans for how current situation is affected by broader trends</li> <li>● Integrates issues, political environment and risks when considering possible actions</li> <li>● Supports organization vision and goals through strategy</li> <li>● Addresses behaviours that challenge progress</li> </ul>	<b>Understanding local and provincial climate is in itself a system.</b> This position must identify the current agriculture will be affected by the current and broader moisture and temperature trends. Excessive moisture and drought are politically charged words and this position must understand the science and the political environment

			when developing media information and informing stakeholders plus the Executive Leadership.
Creative Problem Solving	○ ○ ○ ○ ●	<p>Creates the environment for innovative problem solving:</p> <ul style="list-style-type: none"> <li>• Generates new ways of thinking; ensures right questions are being asked about a problem</li> <li>• Eliminates barriers to creativity and innovation</li> <li>• Encourages a culture of innovation</li> </ul>	<p>The GoA is leading the rest of the provinces and innovating an agri-meteorological network out ahead of any other entity. This requires new ways of thinking, identifying problems to solve and asking the right questions. This position regularly removes barriers so the staff can continue to be creative and innovative. The team built a one of a kind network management system to track every sensor in the system across the sensors entire lifespan. The information from these sensors stand up in court.</p>
Agility	○ ○ ○ ○ ●	<p>Creates an adaptable environment:</p> <ul style="list-style-type: none"> <li>• Fosters agility, proactive and flexible practices</li> <li>• Leads and creates momentum for change</li> <li>• Champions plan of action and overcomes barriers through proactive anticipation</li> <li>• Quickly understands and reacts to environment, establishing flexible culture</li> </ul>	<p>The IT world is constantly changing and this position leads a group that must bend and flex to keep up to technology and the rules in place that keep the GoA system safe. This requires agility and flexibility. Recently, a service provider cancelled a critical service the GoA relied upon. This position encouraged staff to reach out to their networks and come up with an array of solutions, anticipating the best solution may be a cross cut of multiple ideas. The team reacted quickly and uncover an innovative solution saving the data and the network.</p>
Develop Networks	○ ○ ○ ○ ●	<p>Builds trust to fairly represent every party:</p> <ul style="list-style-type: none"> <li>• Uses network to identify opportunities</li> </ul>	<p>This position is called upon to provide on the spot information to the Deputy Minister and other</p>

		<ul style="list-style-type: none"> <li>• Establishes credibility and common purpose with a range of people</li> <li>• Actively represents needs and varying groups</li> <li>• Creates strategic impression by inspiring and connecting with values and beliefs</li> </ul>	<p>executives. In addition this position works directly with the media and presents to stakeholders regularly. All must view this person as credible and trustworthy. The information shared must represent the needs of the varying groups. The information presented in ACIS is from 512 unique stations in Alberta, only 193 are AGI owned and operated. This position must maintain excellent working relationships with other organizations to continue to use their data.</p>
<p>Build Collaborative Environments</p>	<p>○ ○ ○ ○ ●</p>	<p>Creates an open environment of communication:</p> <ul style="list-style-type: none"> <li>• Promotes sharing of expertise</li> <li>• Initiates strategic communication systems</li> <li>• Anticipates and addresses potential conflict areas</li> <li>• Inspires with a bold, complete and shared vision</li> <li>• Leads cross-functional collaboration</li> </ul>	<p>As only a unit of 10 staff this position must encourage cross training so staff can step in and help when needed. In addition this creates empathy and good morale for the staff giving them a break from their jobs and appreciating what others do. The staff work out of six different offices across Alberta and this position ensures they all have the tech they need to communicate. The staff are passionate and have a wide range of skillsets which can lead to conflict. This position must understand and help the various roles communicate and learn to respect each other.</p>