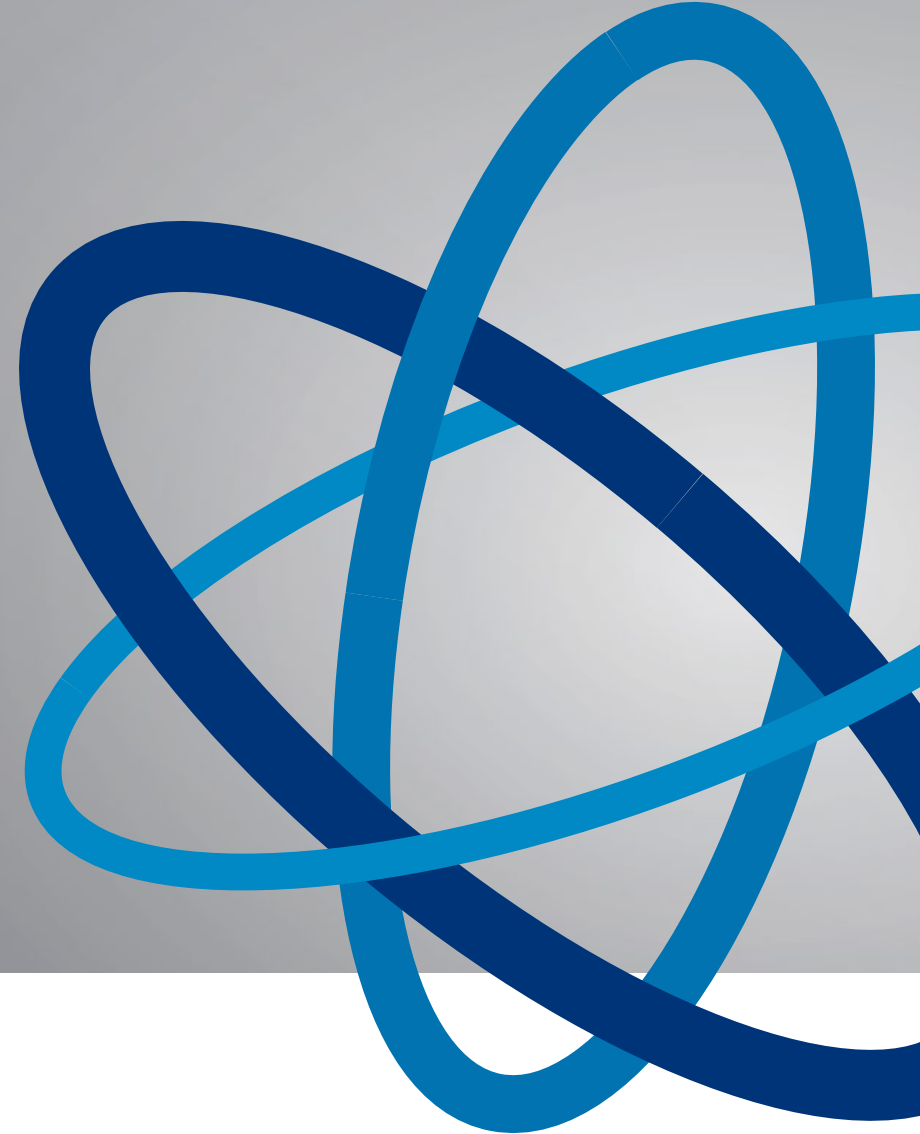


# OUR FUTURE, OUR PLAN FOR NUCLEAR POWER

SMR Development in Saskatchewan  
Regional Evaluation Process Workshop #3

March 21 & 23, 2023



# Land Acknowledgement



SaskPower's work reaches the ancestral lands of many Nations.

This includes those Nations on Treaty 2, 4, 5, 6, 8 and 10 territories as well as the Dakota and Métis Nations.

*As a Crown utility, we reaffirm our relationship with the Peoples of these lands and honour our shared determination to preserve the lands for generations to come.*

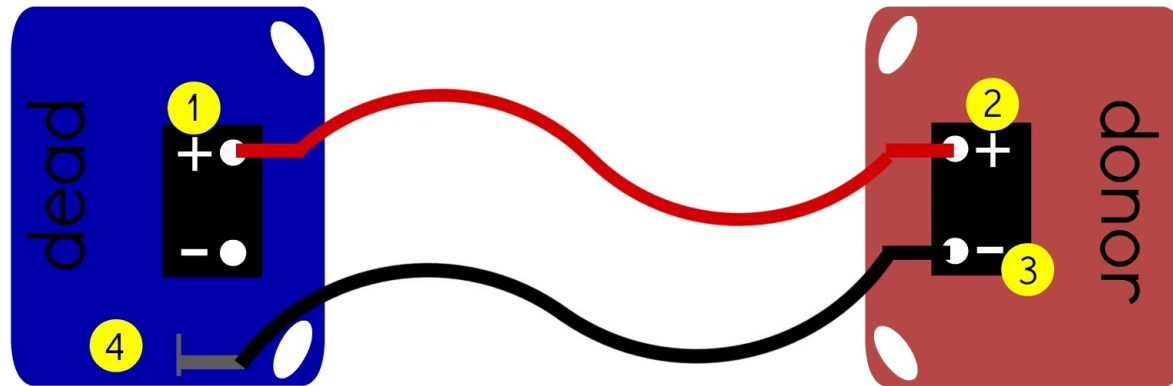
# **SAFETY MOMENT**

# How To JUMP A CAR

Begin with both cars OFF

-----

1. Connect RED with dead +
2. Connect RED with donor +
3. Connect BLACK with donor -
4. Connect BLACK to bare metal



5. Start donor car
6. Start dead car
7. Disconnect 4-3-2-1



# Regional Evaluation Process Report-Update

## Draft 2 will be issued Prior to Workshop #4

Small Modular Reactor Development Project

### REGIONAL EVALUATION PROCESS REPORT: DRAFT 1



- Will include information from Workshop #1, #2 and #3
- Final Report will be issued following Workshop #4

# Agenda

9:10 – 9:20	Welcome, Land Acknowledgement, Safety
9:20 – 9:30	<b>Session #1:</b> Ice Breaker & Recap
9:30 – 10:30	<b>Session #2:</b> Siting Progress
Break	
10:45 – 11:30	<b>Session #3:</b> Water Valuation
11:30 – 12:00	<b>Session #4:</b> Impact Assessment
Lunch	
12:30 – 1:30	<b>Session #5:</b> Nuclear Waste
1:30 – 1:45	<b>Session #6:</b> Regional Identity
Break	
2:00 – 2:15	<b>Session #7:</b> Social and Economic
2:15 – 2:30	Wrap-up



# Welcome Back Ice Breaker

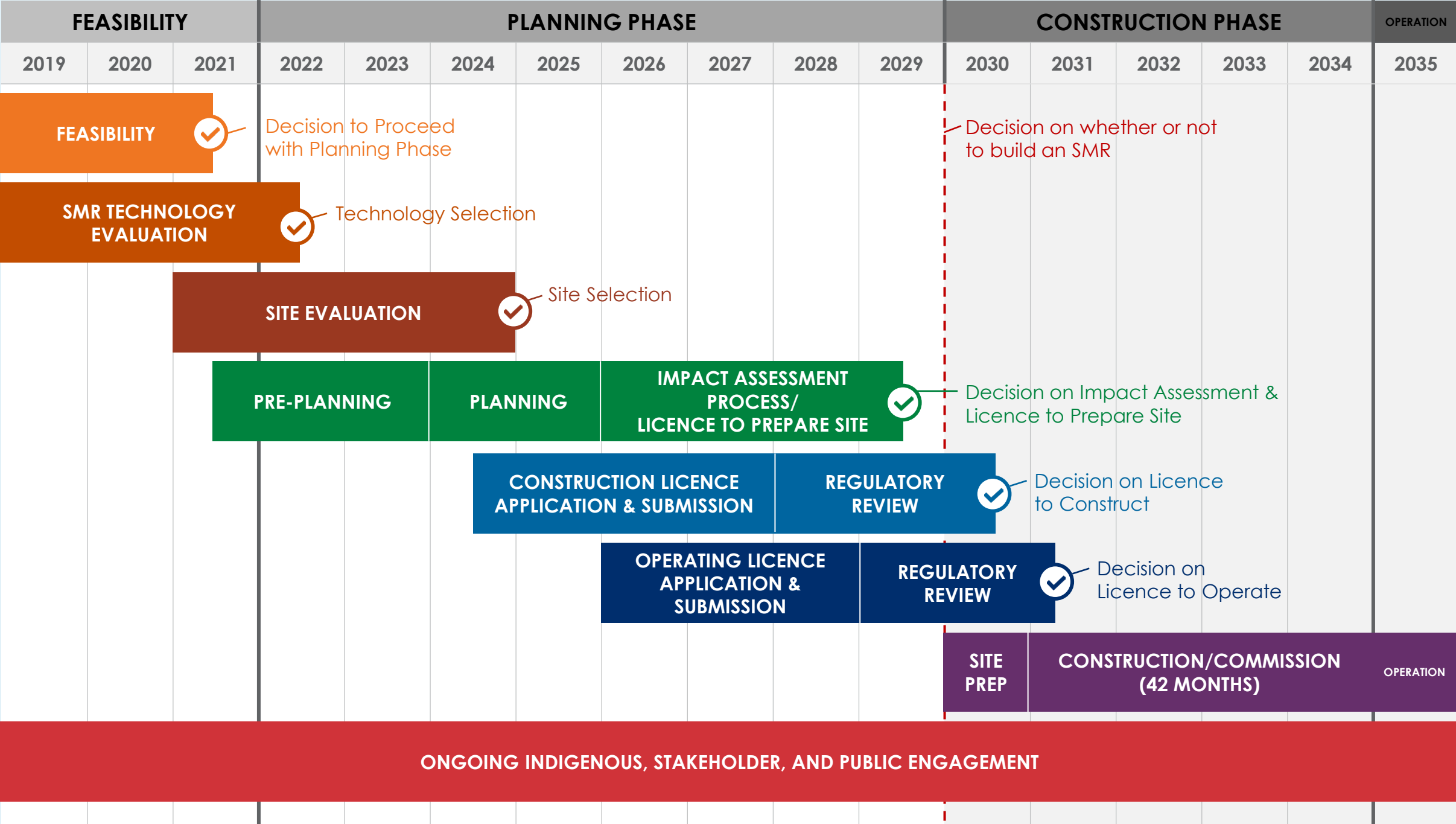
Go to [www.menti.com](https://www.menti.com) and use the code:

**6674 227**

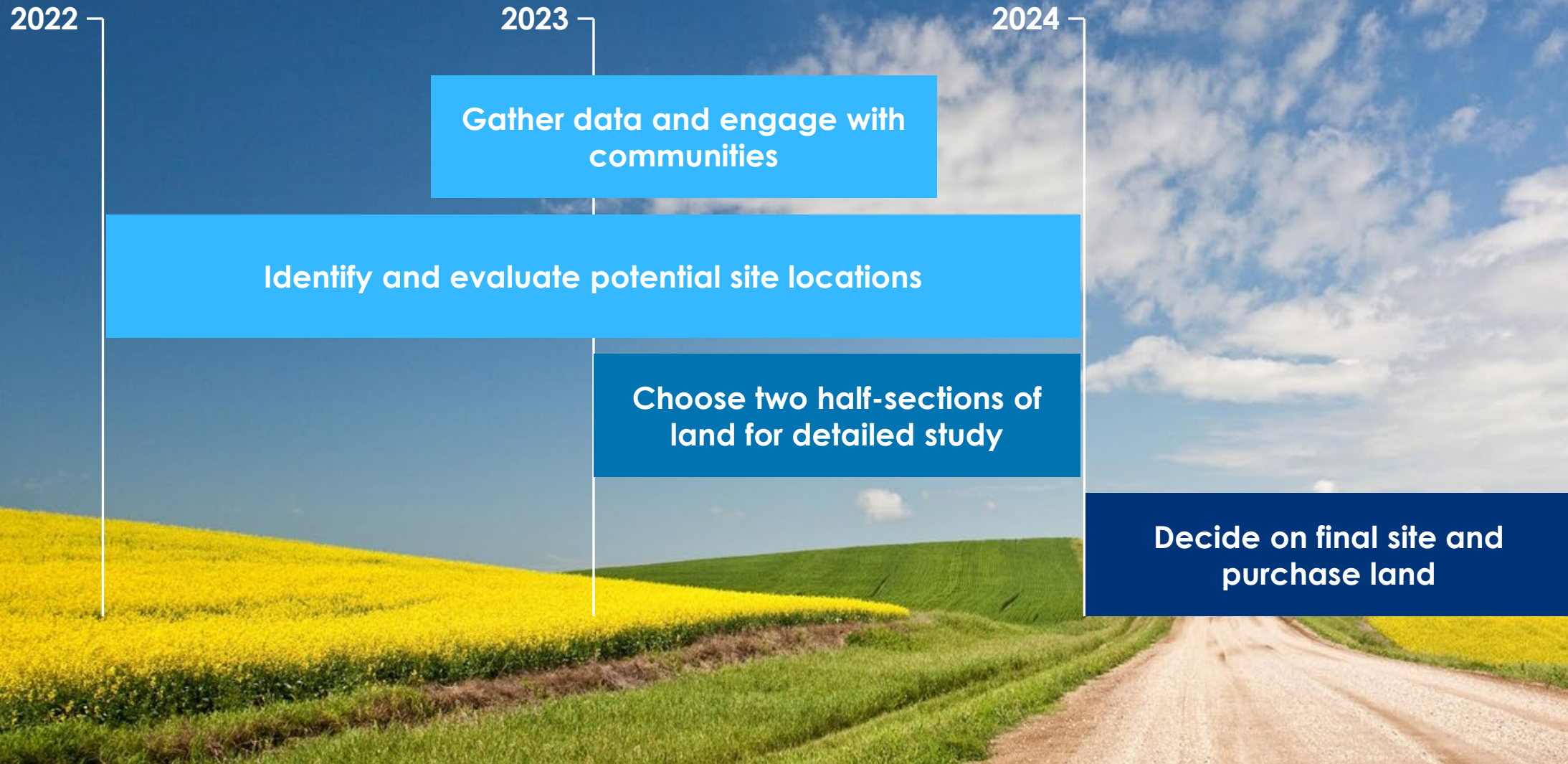


# Site Selection Process - Continued





# Site Evaluation Steps





# Social and Technical Studies to Support Siting

Gather data and engage with communities

Technical Studies

Field Surveys

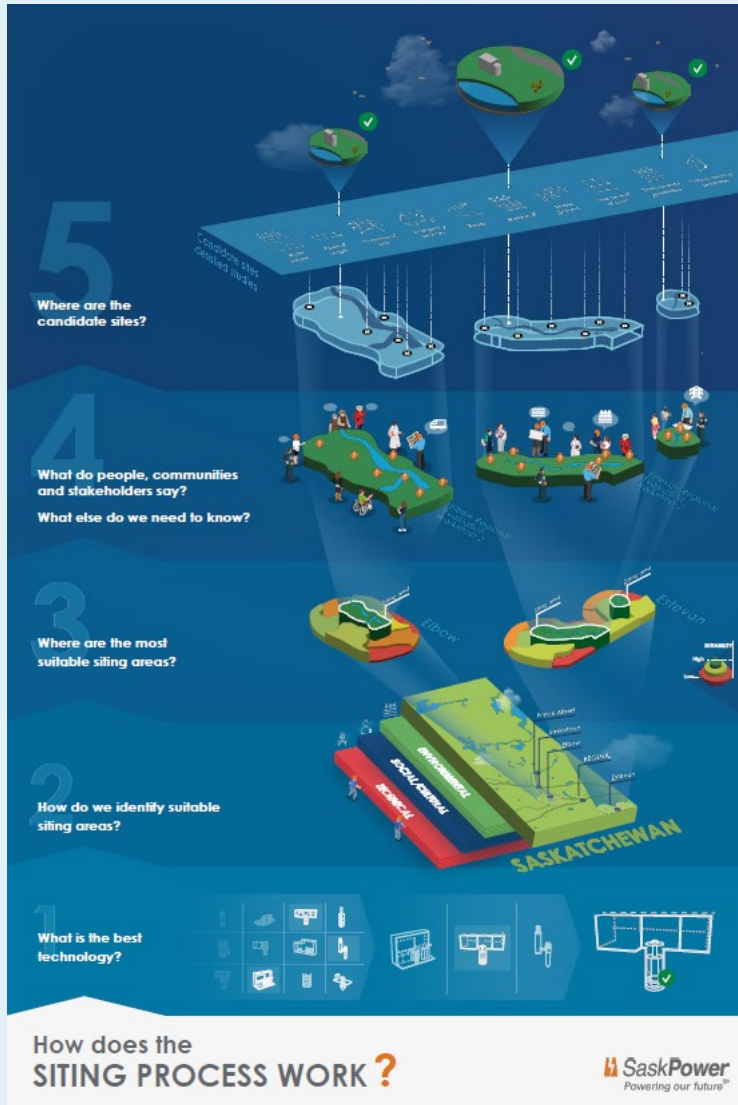
Indigenous / Public Engagement

Consultations with Rights Holders

Regional Evaluation Process



# Agenda



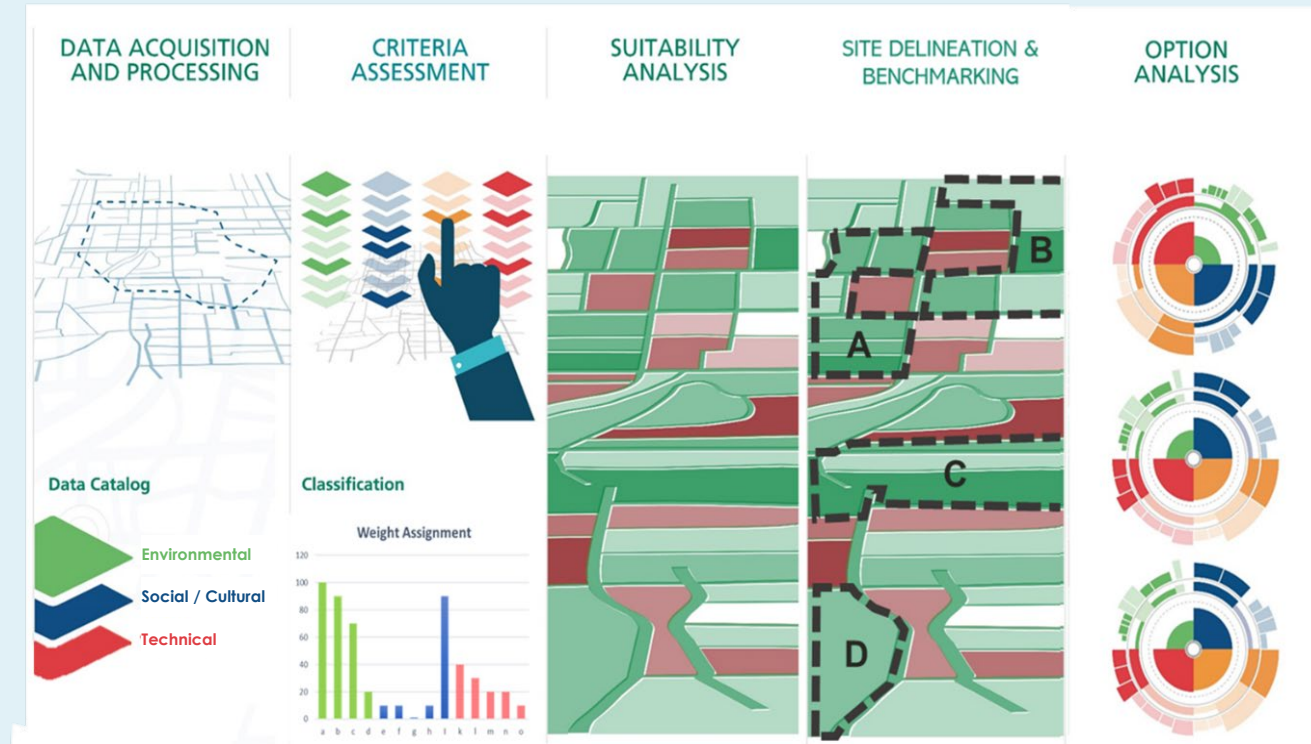
## Topics (1 hour)

- Outcomes of REP2
- What's changed for REP3
- REP3 modelling results
- Detailed siting and beyond – scorecard development
- Scorecard group exercise
- Actions / next steps



# Initial Siting Criteria and Tools

Theme	Criteria
Environmental	Protected lands Rare/endangered species Terrestrial wildlife habitat inventory lands Woodland caribou habitat Wetlands Permanent waterbodies Permanent watercourses Aquatic species at risk range Federal critical habitat areas Managed lands
Social/Cultural	First Nations Reserves Urban municipal areas Future urban development Heritage sensitivity Department of National Defence military lands Proximity to workforce Population density International border
Technical	Aerodrome airspace Airspace - advisory Airspace - restricted Managed dams Drought potential Existing power plants Faults Fire hazard O&G wells and facilities Pipelines high pressure Pipelines water Railways SaskPower lands Seismic hazard Severe precipitation Switching stations Surficial geology Tornado potential Transmission grid Water sources



# Step 3 – Siting Areas

3  
Where are the most suitable siting areas?



- Suitability analysis identified three candidate study areas for siting for REP2
- REP2 “what we have heard” results to refine the siting model indicators:
  - Revised – 9
  - Removed – 7
  - Unchanged - 39





# REP3 Indicator Workbooks



WORKBOOK

## Regional Evaluation Process (REP)

Workshop 3 - Both

Estevan, Saskatchewan,  
March 21 - 23, 2023

### Social/Cultural

#### Indicators

11. Cemeteries
12. First Nations Reserves
13. Future Urban Development
14. Heritage Sensitivity
15. International Border
16. Population Density
17. Population Density > 200
18. Proximity to Workforce
19. SaskPower Lands
20. Urban Municipal Areas

### Environmental

#### Indicators

01. Federal Critical Habitat
02. Federal Critical Habitat Proximity
03. Managed Lands
04. Protected Lands
05. Protected Lands Proximity
06. Rare/Endangered Species
07. TWHI Wildlife Habitat
08. Waterbodies
09. Watercourses
10. Wetlands

### Technical

#### Indicators

- |                                      |                                  |
|--------------------------------------|----------------------------------|
| 21. Aerodrome - Small                | 35. Oil and Gas Wells            |
| 22. Airspace - Advisory              | 36. Oil and Gas Wells Proximity  |
| 23. Aquifers                         | 37. Pipelines                    |
| 24. Dams                             | 38. Railway Proximity - Mainline |
| 25. Existing Power Plants            | 39. Railway Proximity - Spurs    |
| 26. Faults                           | 40. Regional Power Demand        |
| 27. Gas Storage                      | 41. Seismic Hazard               |
| 28. Hazardous Facilities             | 42. Severe Precipitation         |
| 29. Hazardous Facilities Proximity   | 43. Surficial Geology            |
| 30. High Pressure Pipeline Proximity | 44. Tornado Potential            |
| 31. Highway Proximity - Primary      | 45. Transmission Grid 230 kV     |
| 32. Highway Proximity - Secondary    | 46. Water Sources                |
| 33. Linear Infrastructure            | 47. Water Sources Proximity      |
| 34. Mining                           | 48. Water Wells                  |

# REP3 Revised Indicators

## FUTURE URBAN DEVELOPMENT

Minimize encroachment on future development lands



### SOURCE

Information Services Corporation (ISC)



### LAYER PRE-PROCESSING AND COMMENTS

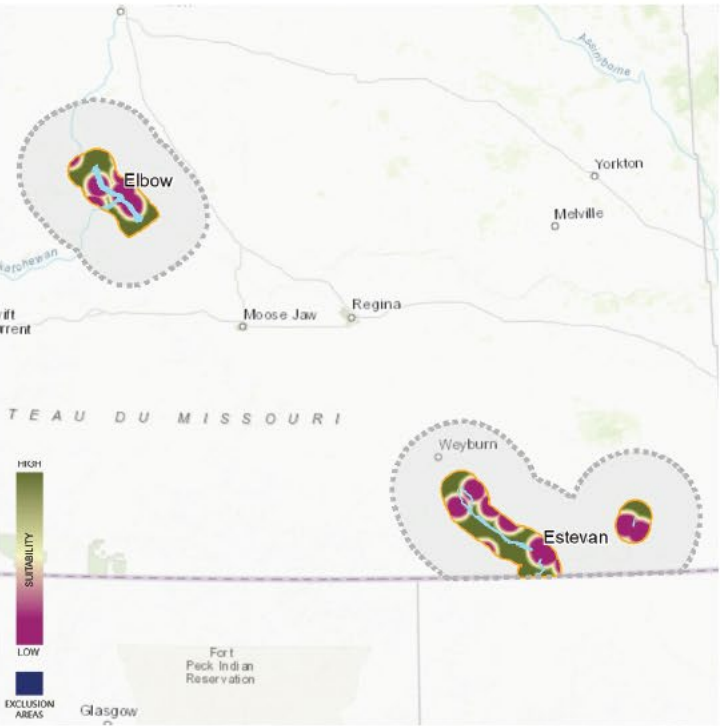
1 km exclusion area added beyond municipal boundary. Buffer of 0 to 5 km of low suitability from municipal boundary, distance decay added from 5 to 10 km from low to high suitability.



### DESCRIPTION

Encroachment on land adjacent to urban municipality boundaries should be minimized to provide flexibility for future urban development. An additional 1 km exclusion (no-go) zone has been added to municipal boundaries. Area beyond 5 km of communities is assumed to have a lower risk of high-density development in the next 60 years.

### GEOGRAPHIC EXTENT



### WEIGHT FOR SMR SITING



13

Future Urban Development

Do





# REP3 Revised Indicators

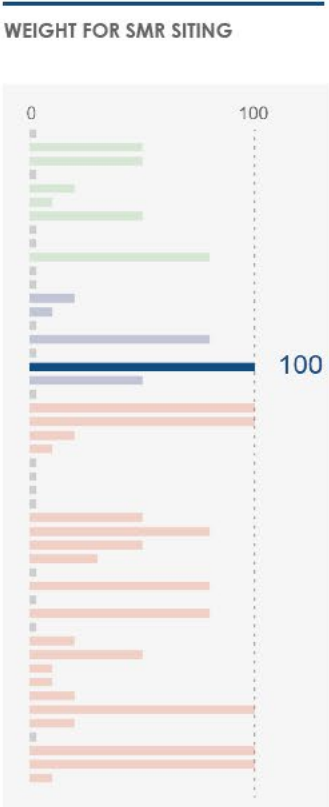
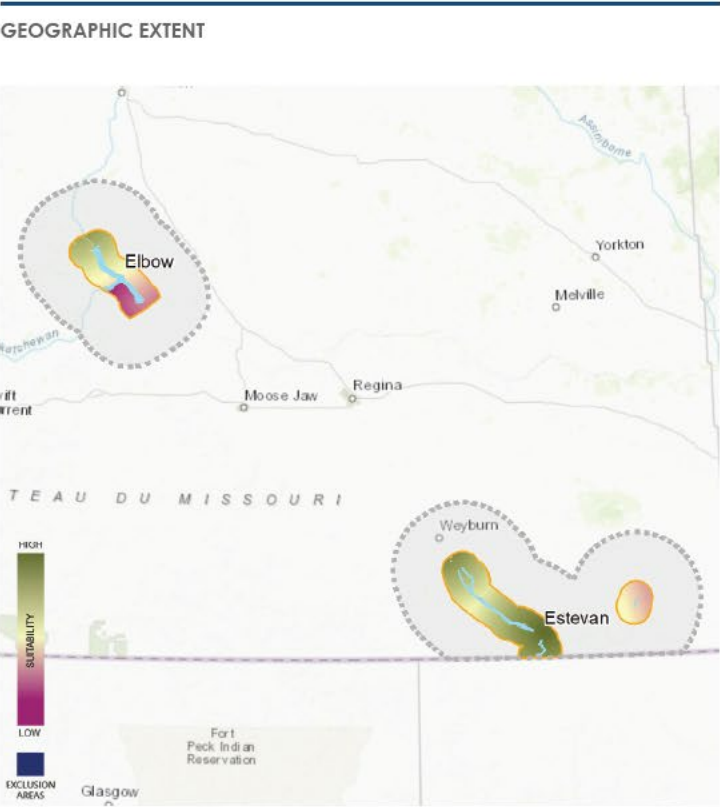
## PROXIMITY TO WORKFORCE

Prefer sites within 100 km of settlements > 2,000 people

**SOURCE**  
Stats Canada 2021 Census data

**LAYER PRE-PROCESSING AND COMMENTS**  
Calculate population of populated areas by adding the population of dissemination blocks within them. Distance decay buffer added from 0 to 100 km. Lakes and Reservoirs blocked except for bridges.

**DESCRIPTION**  
Population centers greater than 2,000 people provide a localized workforce and access to emergency services (e.g., hospitals, fire, police and EMS). The 2021 Statistics Canada Census data was used for communities above 2,000 people.



# REP3 Revised Indicators

## URBAN MUNICIPAL AREAS

Avoid encroaching on urban areas



### SOURCE

Information Services Corporation (ISC)  
Geogratis, Natural Resources Canada (NRCan)



### LAYER PRE-PROCESSING AND COMMENTS

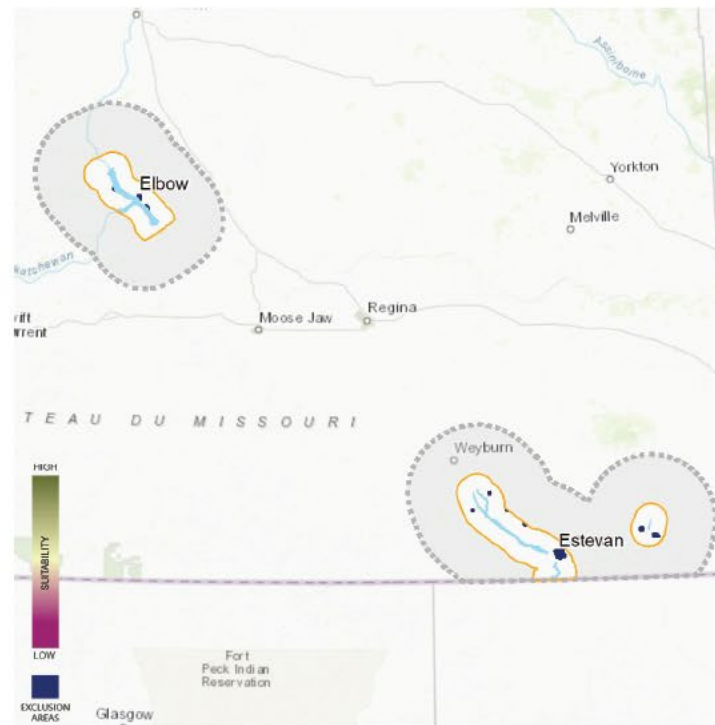
1 km buffer on urban municipalities.



### DESCRIPTION

Avoid siting within 1 km of the legal boundary of urban municipalities.

### GEOGRAPHIC EXTENT



### WEIGHT FOR SMR SITING



20

Urban Municipal Areas



# REP3 Revised Indicators

## AQUIFERS

Avoid interaction with groundwater aquifers



**SOURCE**  
Water Security Agency (WSA)

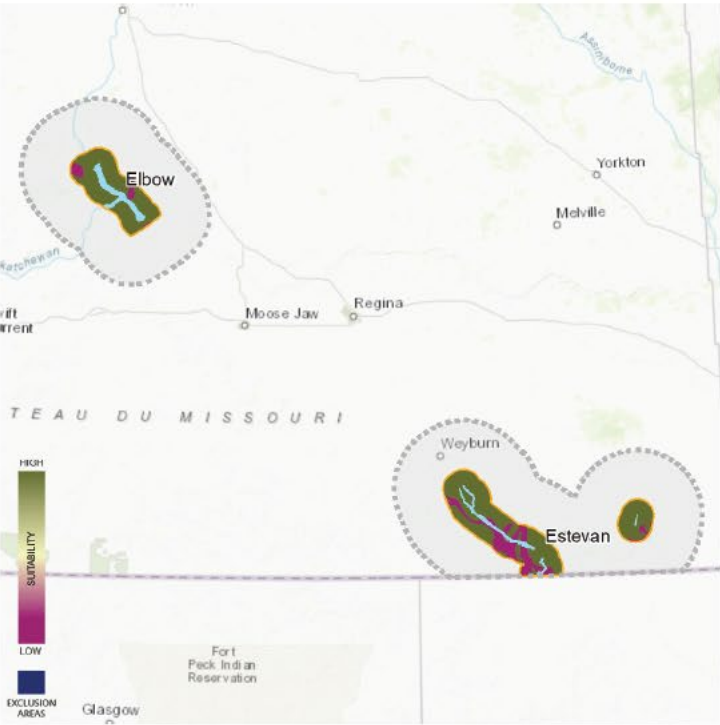


**LAYER PRE-PROCESSING AND COMMENTS**  
No buffer added.



**DESCRIPTION**  
Regionally extensive major aquifers such as the Estevan Valley aquifer Empress Group are less favorable for SMR siting to reduce the potential for project related interactions. Less extensive and more localized drift aquifers such as the Interill, Sutherland and Saskatoon Groups will also be considered at a local siting level. There are uncertainties in the aquifer boundary data used at this scale. Other data sources can be used at the site specific scale to better define the presence of aquifers. Additional data can also be collected through detailed, site specific hydrogeological investigations to support siting evaluations.

GEOGRAPHIC EXTENT



WEIGHT FOR SMR SITING



# REP3 Revised Indicators

## MINING

Avoid proximity to Mines



**SOURCE**  
SaskPower

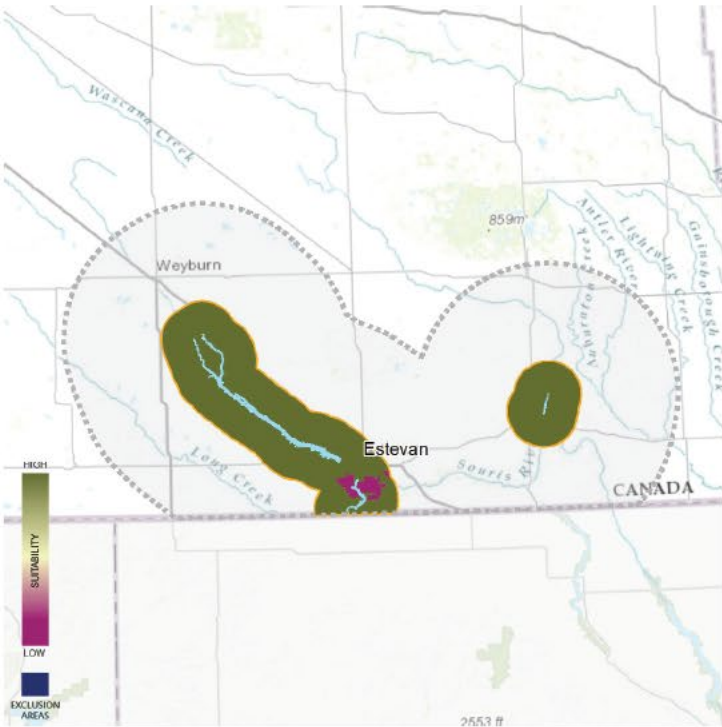


**LAYER PRE-PROCESSING  
AND COMMENTS**  
No buffer added

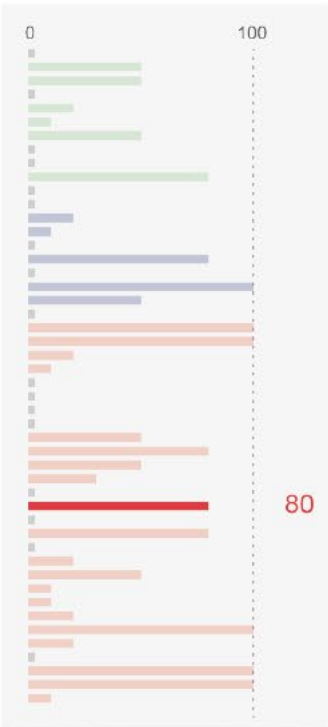


**DESCRIPTION**  
The site should not be situated on current mining areas or mined and remediated areas.

### GEOGRAPHIC EXTENT



### WEIGHT FOR SMR SITING



34

Mining



# REP3 Revised Indicators - Continued

Theme	Indicator	Revisions / Action
Social/ Cultural	Population Density	Obtain 2021 census results and recalculate
Social/ Cultural	Population Density > 200	Obtain 2021 census results and recalculate
Technical	Hazardous Facilities Proximity	Reduce distance decay from 8 to 4km
Technical	Regional Power Demand	Reduced weight from 80 to 10 based on transmission study findings
Technical	High Pressure Pipeline Proximity	Removed water pipelines from proximity



# REP3 Removed Indicators

Theme	Indicator	Rationale
Environmental	Aquatic Species at Risk Range	All PSAs are equally ranked for this indicator so it is not discerning. This will be considered further at detailed siting phase
Environmental	Woodland Caribou Habitat	Does not occur within the PSAs
Social/ Cultural	Department of National Defense (DND) Military Lands	Does not occur within the PSAs
Technical	Aerodrome - Large	Does not occur within the PSAs
Technical	Airspace - Restricted	Does not occur within the PSAs
Technical	Drought Potential	PSAs are all very similar and the data uncertainty / error is likely high. This will be considered further at detailed siting phase
Technical	Historical Fires	All PSAs are equally ranked for this indicator so it is not discerning. This will be considered further at detailed siting phase





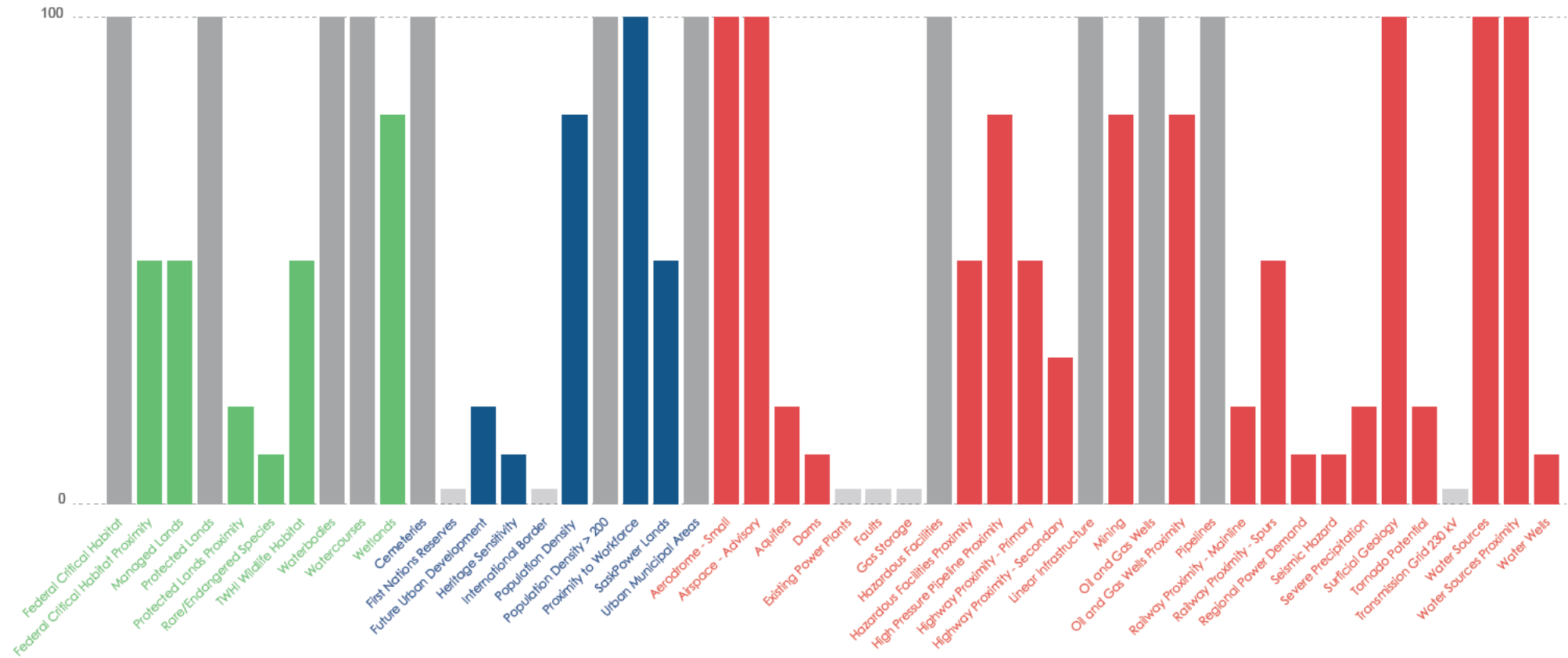
# Unchanged Indicators

Theme	Indicator	Comment
Environmental	FEDERAL CRITICAL HABITAT	*Note - unchanged indicators to be evaluated further at detailed siting phase
Environmental	FEDERAL CRITICAL HABITAT PROXIMITY	
Environmental	MANAGED LANDS	
Environmental	PROTECTED LANDS	
Environmental	PROTECTED LANDS PROXIMITY	
Environmental	RARE/ENDANGERED SPECIES	
Environmental	TWHI WILDLIFE HABITAT	
Environmental	WATERBODIES	
Environmental	WATERCOURSES	
Environmental	WETLANDS	
Social and Cultural	CEMETERIES	
Social and Cultural	FIRST NATIONS RESERVES	Background
Social and Cultural	HERITAGE SENSITIVITY	
Social and Cultural	INTERNATIONAL BORDER	
Social and Cultural	SASKPOWER LANDS	

Theme	Indicator	Comment
Technical	AIRSPACE - ADVISORY	
Technical	DAMS	
Technical	EXISTING POWER PLANTS	Background
Technical	FAULTS	Background
Technical	GAS STORAGE	Background
Technical	HAZARDOUS FACILITIES	
Technical	HIGHWAY PROXIMITY - PRIMARY	Confirmed Hwy 219 is present
Technical	HIGHWAY PROXIMITY - SECONDARY	
Technical	LINEAR INFRASTRUCTURE	
Technical	OIL AND GAS WELLS	
Technical	OIL AND GAS WELLS PROXIMITY	
Technical	PIPELINES	
Technical	RAILWAY PROXIMITY - MAINLINE	
Technical	RAILWAY PROXIMITY - SPURS	
Technical	REGIONAL POWER DEMAND	
Technical	SEISMIC HAZARD	
Technical	SEVERE PRECIPITATION	
Technical	SURFICIAL GEOLOGY	
Technical	TORNADO POTENTIAL	
Technical	TRANSMISSION GRID 230 KV	Background
Technical	WATER SOURCES	
Technical	WATER SOURCES PROXIMITY	
Technical	WATER WELLS	



# REP3 Overview of Indicator Weights



Environmental  
DIMENSION



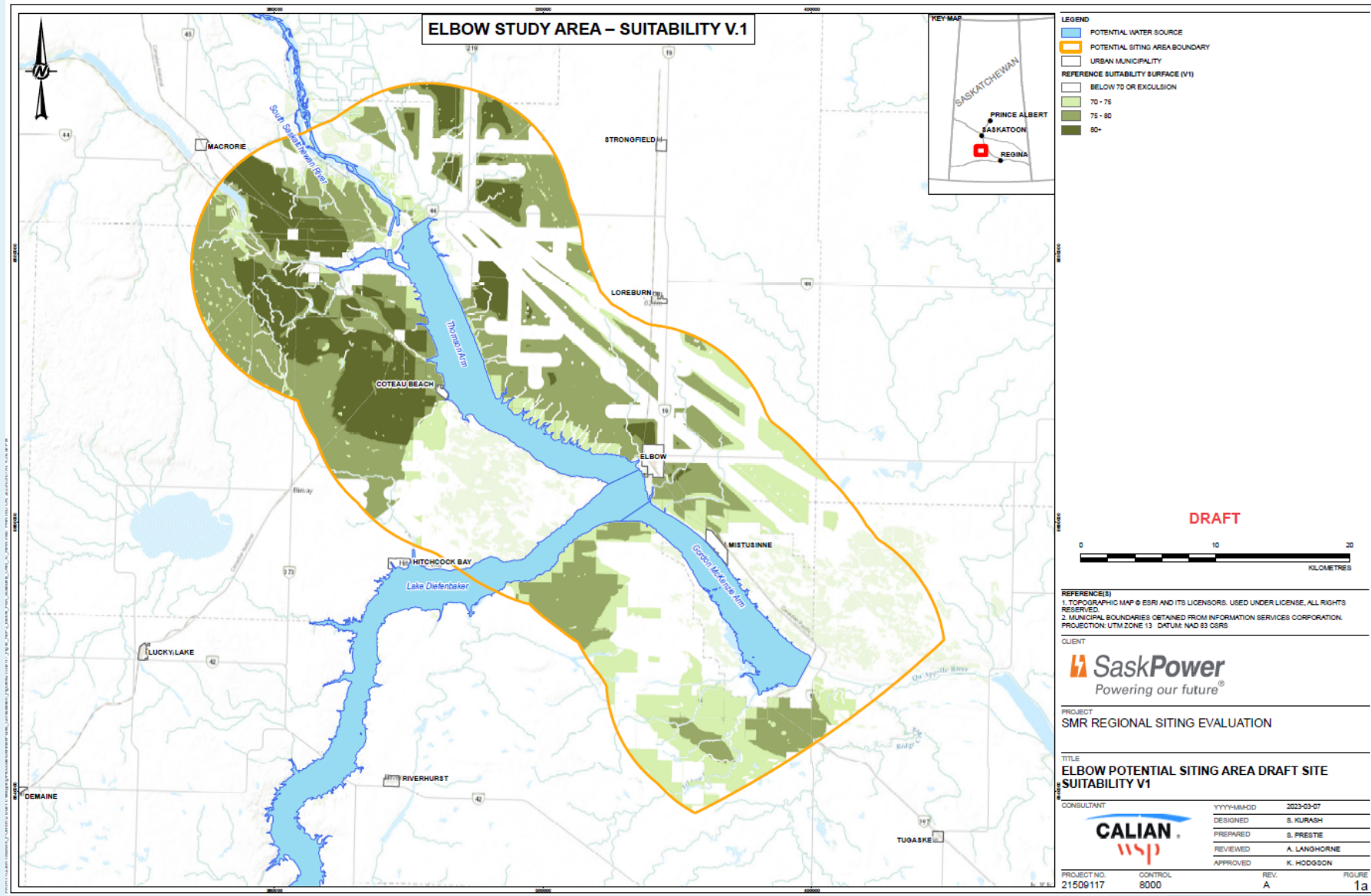
Social/Cultural  
DIMENSION



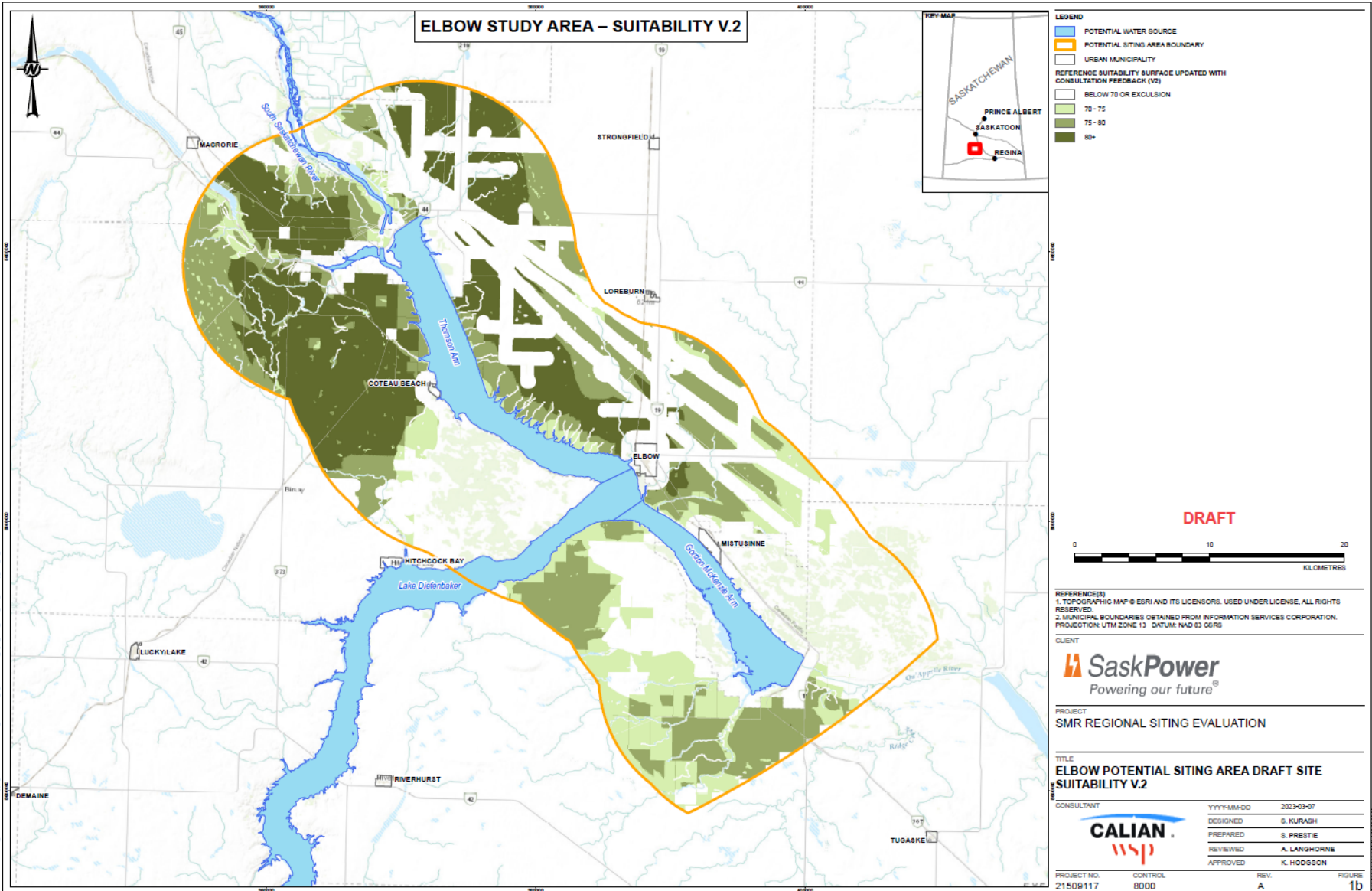
Technical  
DIMENSION



# Elbow Siting Area Results – V.1

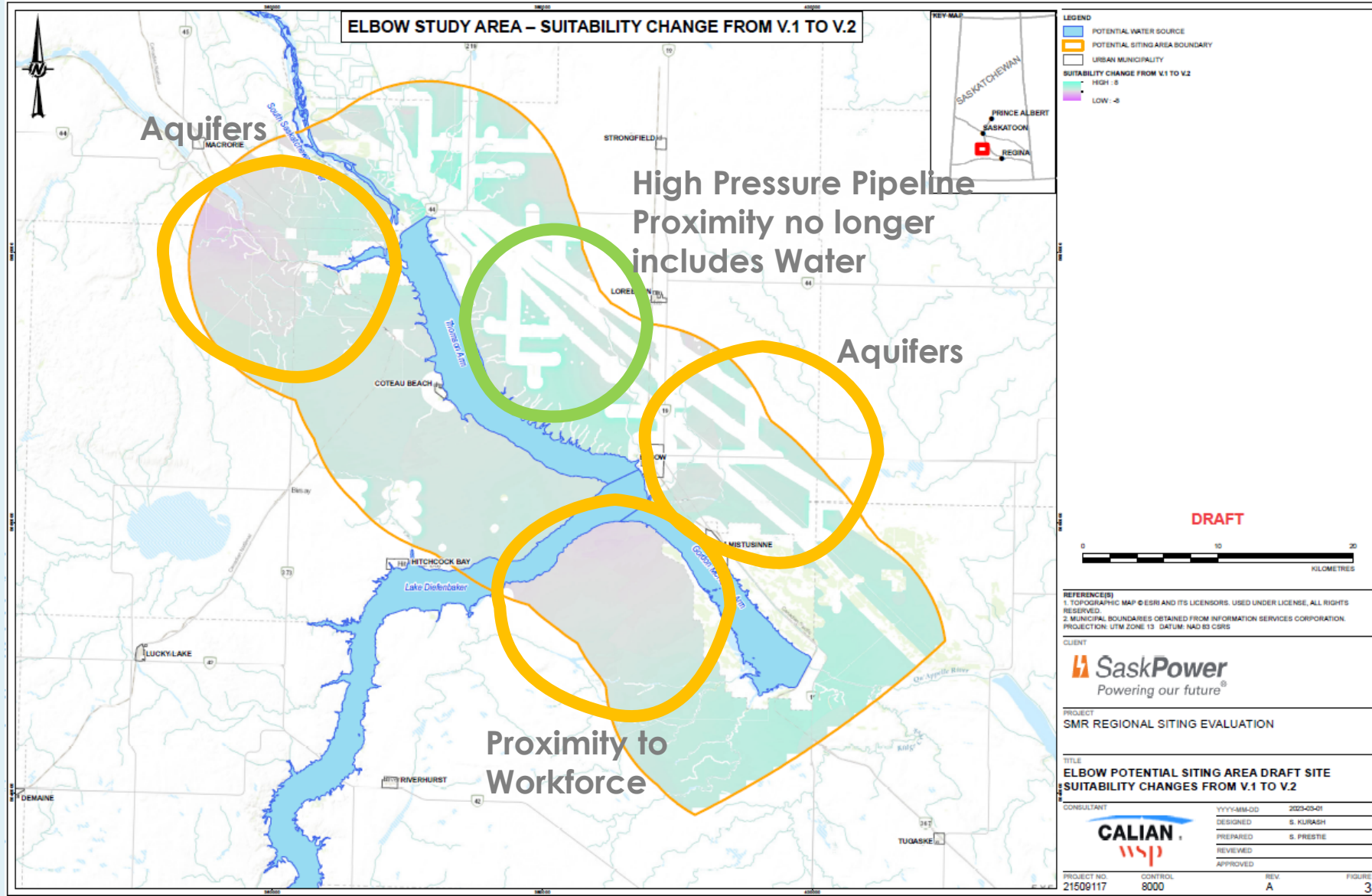


# Elbow Siting Area Results – V.2

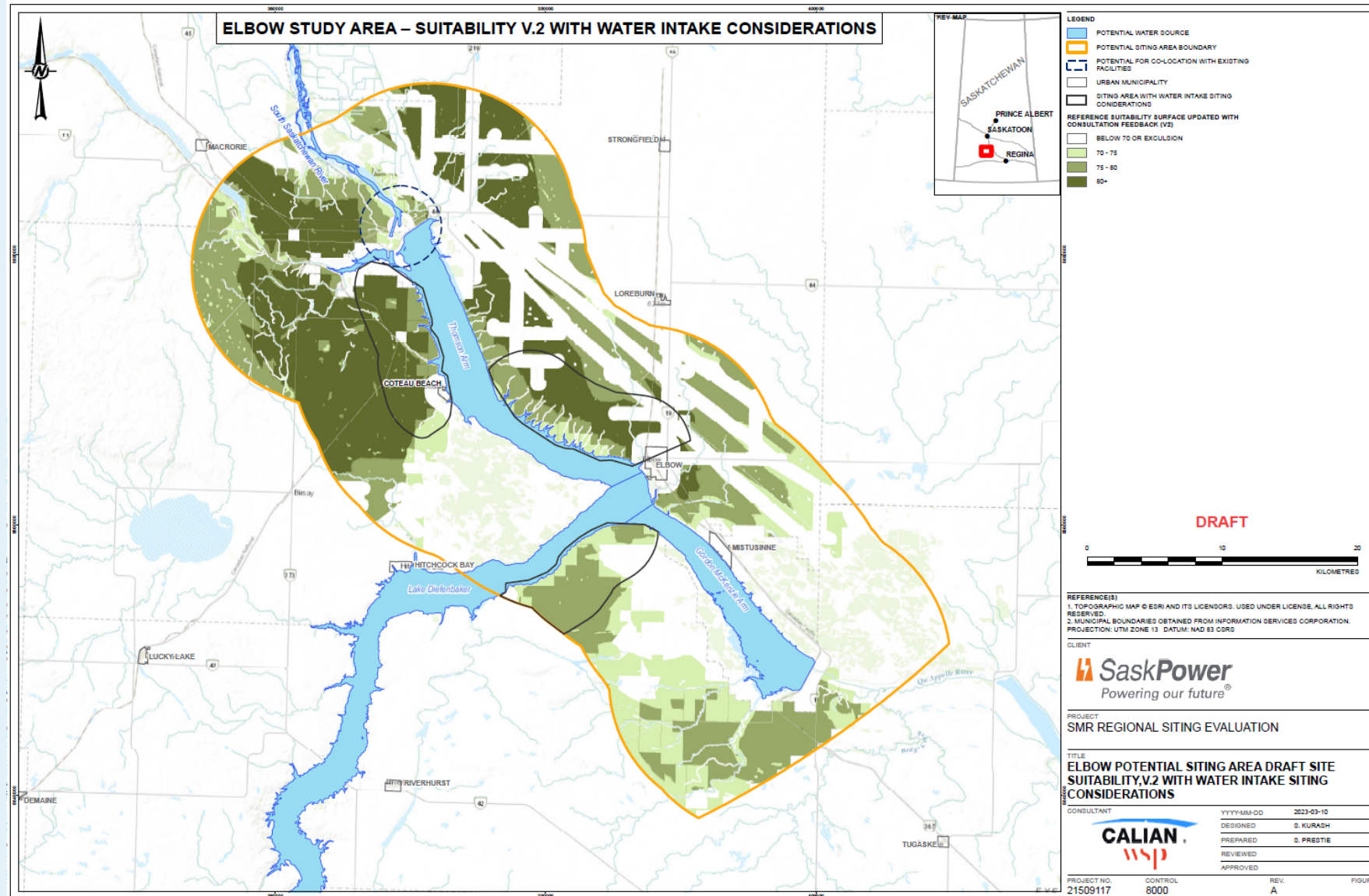




# Elbow Siting Area Results – Suitability Changes



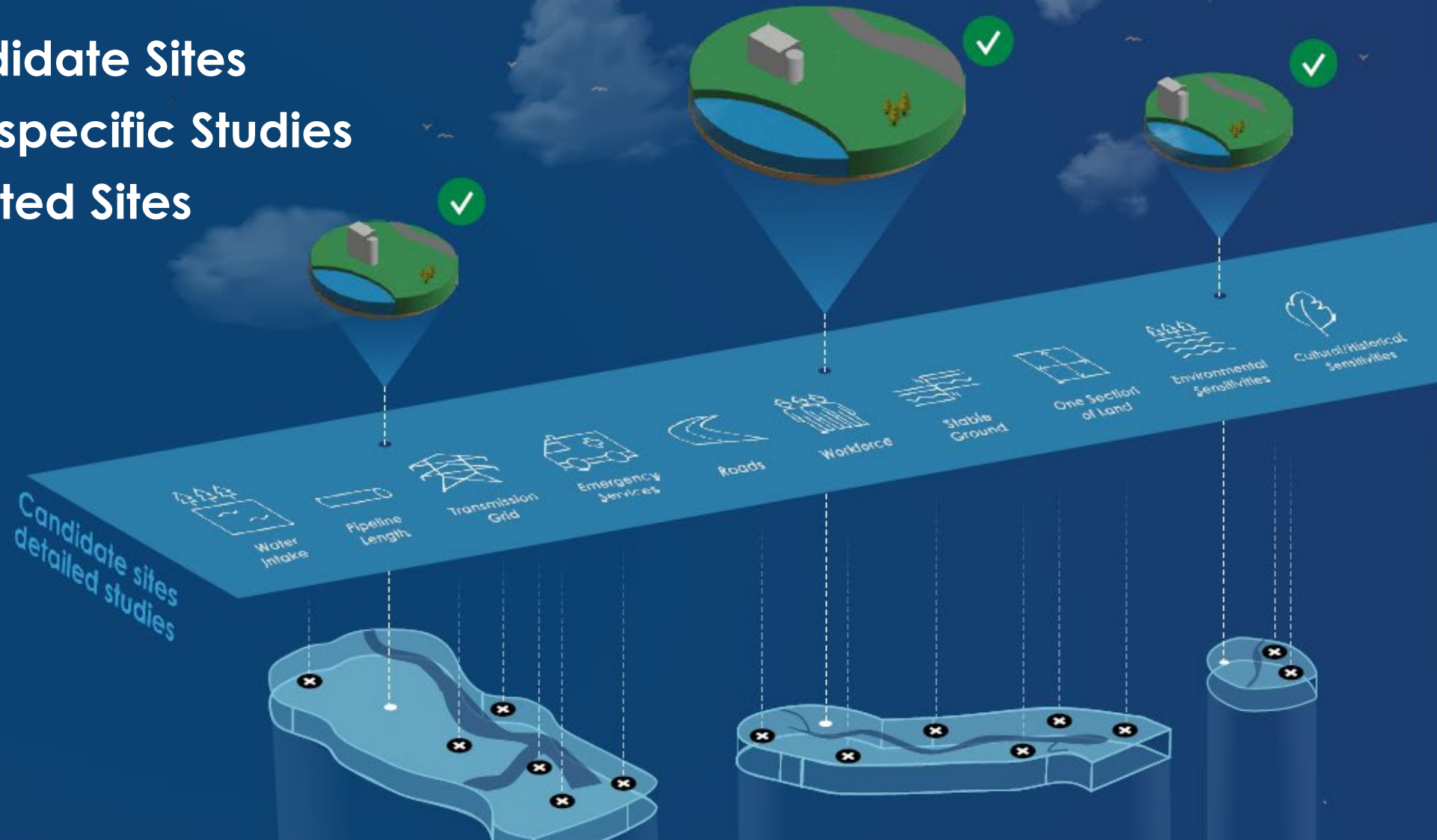
# Elbow Siting Area Results – V.2 with Intake Considerations



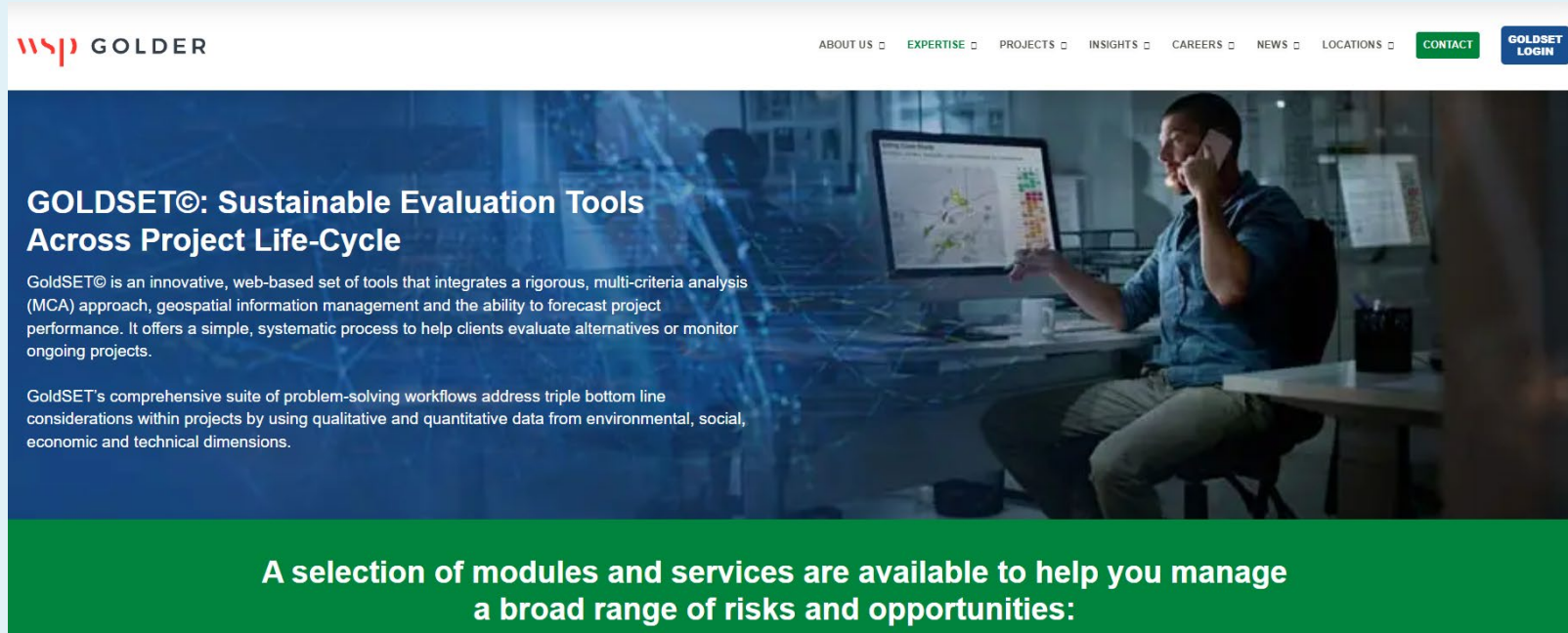


# Step 5 – Candidate Site Detailed Studies

- Multiple Candidate Sites
- Detailed Site-specific Studies
- Select Shortlisted Sites



# Scorecard Development

A screenshot of the WSP GOLDER GoldSET website. The header features the WSP GOLDER logo on the left and a navigation menu with links: ABOUT US, EXPERTISE, PROJECTS, INSIGHTS, CAREERS, NEWS, LOCATIONS, CONTACT, and a GOLDSET LOGIN button. The main content area has a dark blue background with a photo of a man at a desk. The text reads: **GOLDSET®: Sustainable Evaluation Tools Across Project Life-Cycle**. Below this, it states: "GoldSET® is an innovative, web-based set of tools that integrates a rigorous, multi-criteria analysis (MCA) approach, geospatial information management and the ability to forecast project performance. It offers a simple, systematic process to help clients evaluate alternatives or monitor ongoing projects." Another paragraph follows: "GoldSET's comprehensive suite of problem-solving workflows address triple bottom line considerations within projects by using qualitative and quantitative data from environmental, social, economic and technical dimensions." A green banner at the bottom contains the text: "A selection of modules and services are available to help you manage a broad range of risks and opportunities:"

**wsp GOLDER**

ABOUT US ▢ EXPERTISE ▢ PROJECTS ▢ INSIGHTS ▢ CAREERS ▢ NEWS ▢ LOCATIONS ▢ **CONTACT** **GOLDSET LOGIN**

## **GOLDSET®: Sustainable Evaluation Tools Across Project Life-Cycle**

GoldSET® is an innovative, web-based set of tools that integrates a rigorous, multi-criteria analysis (MCA) approach, geospatial information management and the ability to forecast project performance. It offers a simple, systematic process to help clients evaluate alternatives or monitor ongoing projects.

GoldSET's comprehensive suite of problem-solving workflows address triple bottom line considerations within projects by using qualitative and quantitative data from environmental, social, economic and technical dimensions.

**A selection of modules and services are available to help you manage a broad range of risks and opportunities:**

- Score Card = decision-making framework
- Defines key **Aspects**, **Themes** and **Indicators** and their weights used to compare different SMR Sites and select the “best” for further study
- GoldSET option analysis module ([www.golder.com/goldset](http://www.golder.com/goldset))



# Scorecard Example

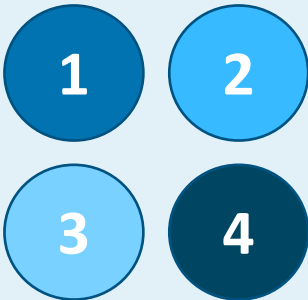
ASPECT	THEME			INDICATOR	
 <b>ENVIRONMENTAL</b>	AQUATIC SPECIES	%		AQUATIC SAR	%
	WATER QUANTITY	%		SENSITIVE SPECIES	%
	WATER QUALITY	%		WATERBODIES / WATERCOURSES	%
	WILDLIFE HABITAT	%		WETLANDS	%
	WILDLIFE SPECIES	%		AQUIFERS	%
	SOIL QUALITY	%		FEDERAL CRITICAL HABITAT	%
	AIR / NOISE	%		TWHI HABITAT	%
				RARE / ENDANGERED SPECIES	%
				CLASS / PRODUCTIVITY	%
 <b>SOCIAL / CULTURAL*</b>	LAND USE	%		EMISSIONS	%
	RECREATION / TOURISM	%		FUTURE URBAN DEVELOPMENT	%
	ACRICULTURE	%		URBAN / MUNICIPAL AREAS	%
	POPULATION / DEMOGRAPHICSC	%		PARKS / RECREATION AREAS	%
	TRADITIONAL LANDUSE	%		ACRICULTUREAL USE	%
	CULTURAL HERITAGE	%		PRODUCTIVITY	%
				POPULATION DENSITY	%
 <b>ECONOMIC</b>	INVESTMENT COST	%		POPULATION > 2000	%
	CONSTRUCTABILITY	%		FIRST NATIONS RESERVES	%
	OPERABILITY	%		INDIGENOUS LAND USE	%
 <b>TECHNICAL / SAFETY</b>	RISKS / HAZARDS	%		HERITAGE SENSITIVITY	%
	EMERGENCY RESPONSE	%		CAPEX	%
	OPERATIONAL REQUIREMENTS	%		CONSTRUCTION COST / COMPLEXITY	%
				OPEX	%
				HAZARDOUS FACILIITES MINING	%
				FIRE / POLICE / MEDICAL	%
				WATER INTAKE / TRANSMISSION	%

\*Note that impacts to Aboriginal and Treaty rights will be considered in the siting decision through the consultation process



# Decision-Making Process

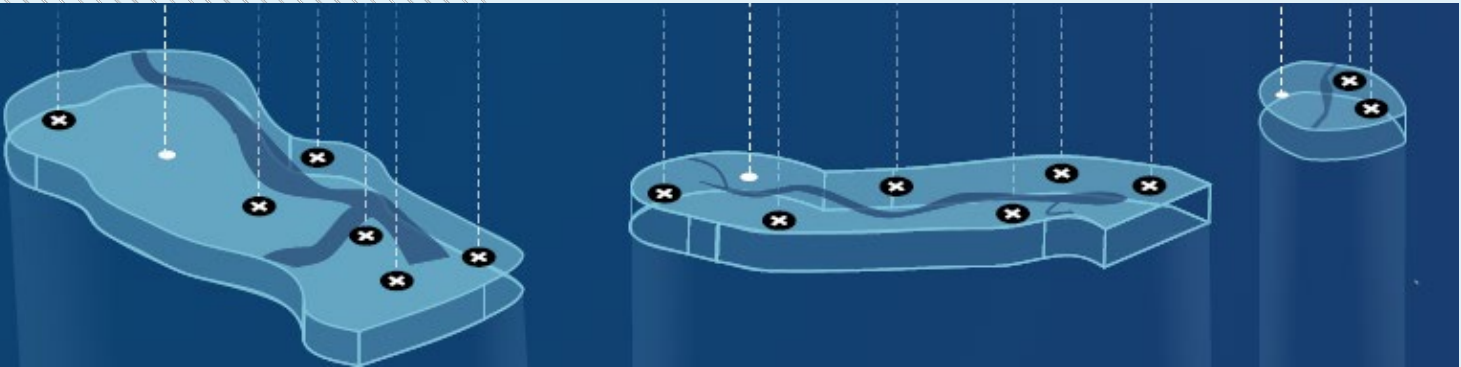
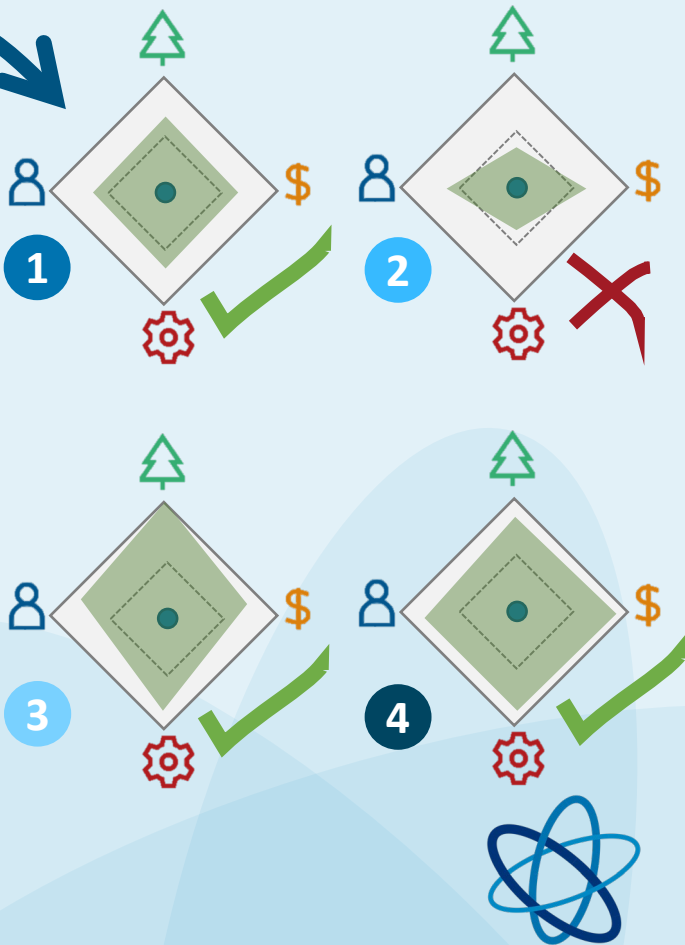
## FEASIBLE SMR SITE OPTIONS



## SCORECARD (GoldSET)

ASPECT	THEME	INDICATOR
ENVIRONMENTAL	AQUATIC SPECIES	AQUATIC SAR
	WATER QUANTITY	SENSITIVE SPECIES
	WATER QUALITY	WATERBODIES / WATERCOURSES
	WILDLIFE HABITAT	WETLANDS
	WILDLIFE SPECIES	AQUIFERS
	SOIL QUALITY	FEDERAL CRITICAL HABITAT
SOCIAL / CULTURAL	LAND USE	TWTH HABITAT
	RECREATION / TOURISM	RARE / ENDANGERED SPECIES
	ACRICULTURE	CLASS / PRODUCTIVITY
	POPULATION / DEMOGRAPHICSC	EMISSIONS
	TRADITIONAL LANDUSE	FUTURE URBAN DEVELOPMENT
	CULTURAL HERITAGE	URBAN / MUNICIPAL AREAS
ECONOMIC	INVESTMENT COST	PARKS / RECREATION AREAS
	CONSTRUCTABILITY	ACRICULTURE USE
	OPERABILITY	PRODUCTIVITY
		POPULATION DENSITY
		POPULATION > 2000
		FIRST NATIONS RESERVES
TECHNICAL / SAFETY	RISKS / HAZARDS	INDIGENOUS LAND USE
	EMERGENCY RESPONSE	HERITAGE SENSITIVITY
	OPERATIONAL REQUIREMENTS	CAPEX
		CONSTRUCTION COST / COMPLEXITY
		OPEX
		HAZARDOUS FACILITIES
		MINING
		FIRE / POLICE / MEDICAL
		WATER INTAKE / TRANSMISSION

## RESULTS



# Activity



# Menti Question – Share Your Priorities

At SaskPower, safety is a top priority.

**How important are these siting criteria to you?**

- Environmental
- Social and Cultural
- Economic

How important are these siting criteria to you?

Rank the following from 1 to 3 (1 = most important).

Environmental



#

Social and Cultural



#

Economic



#



# QUESTIONS

# Break Number One – 15 min



# Water Valuation Update



# Agenda

## 1. What We Have Heard

- Sources of information from engagement
- Information shared on water values
- How engagement results are being used

## 2. Preliminary Results of the Water Valuation Survey

## 3. Identification of Existing Water Values for the Potential Siting Areas

- Environmental values
- Economic values
- Social and cultural values

## 4. Questions or Comments



# Water Values: What We Have Heard



# Sources of Information from Engagement

**The SaskPower engagement events that have been leveraged for our water valuation include the following:**

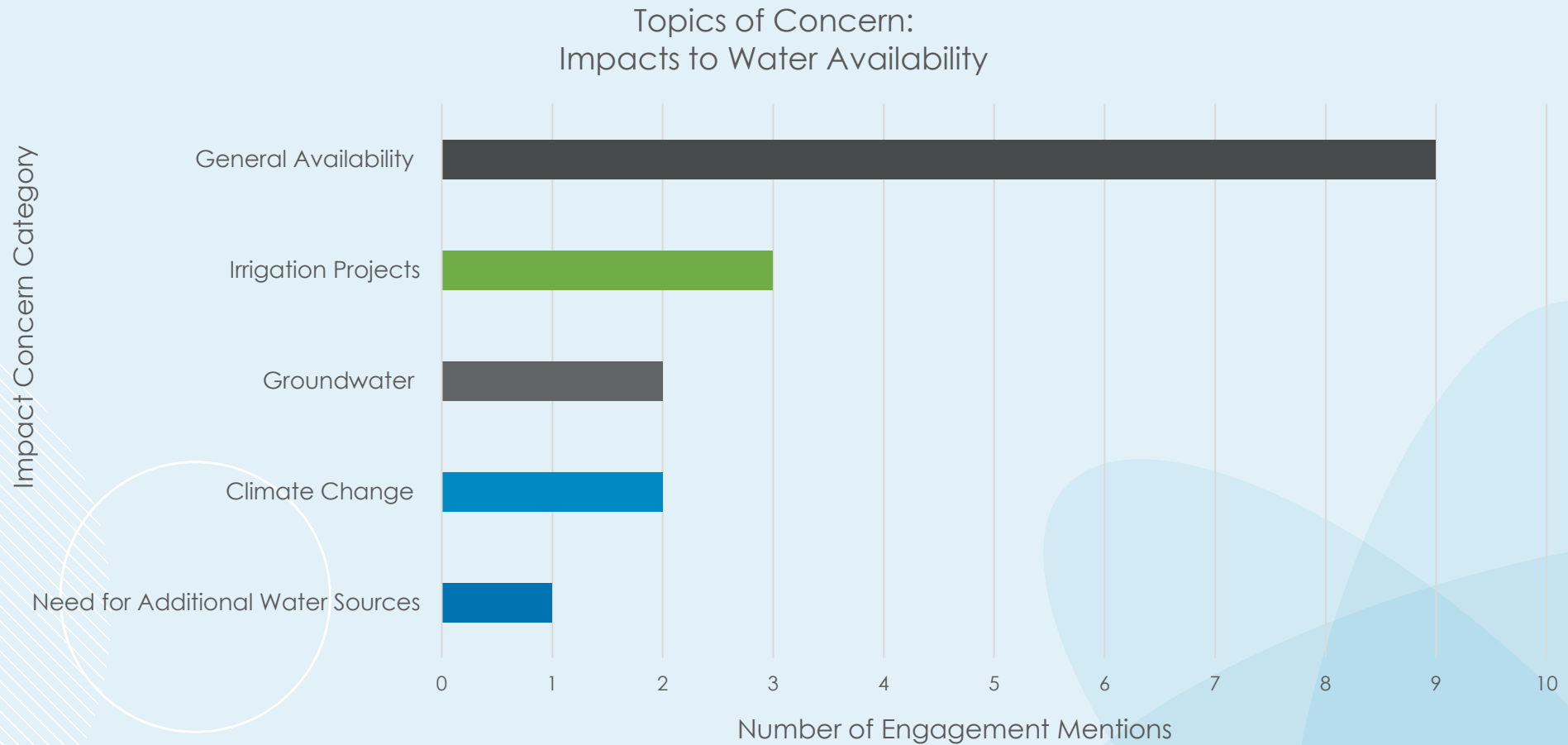
- Virtual Open House
  - Water Valuation Session
  - Project Siting Criteria Session
  - How Nuclear Power Works Session
  - Nuclear Power – Why, When and How?
  - Planning for Nuclear Power
- Municipal Information Session
- Public Information Session
- Indigenous Engagement Session
- Drop-in Events
- REP Workshop #2
- Online Engagement Hub: Survey





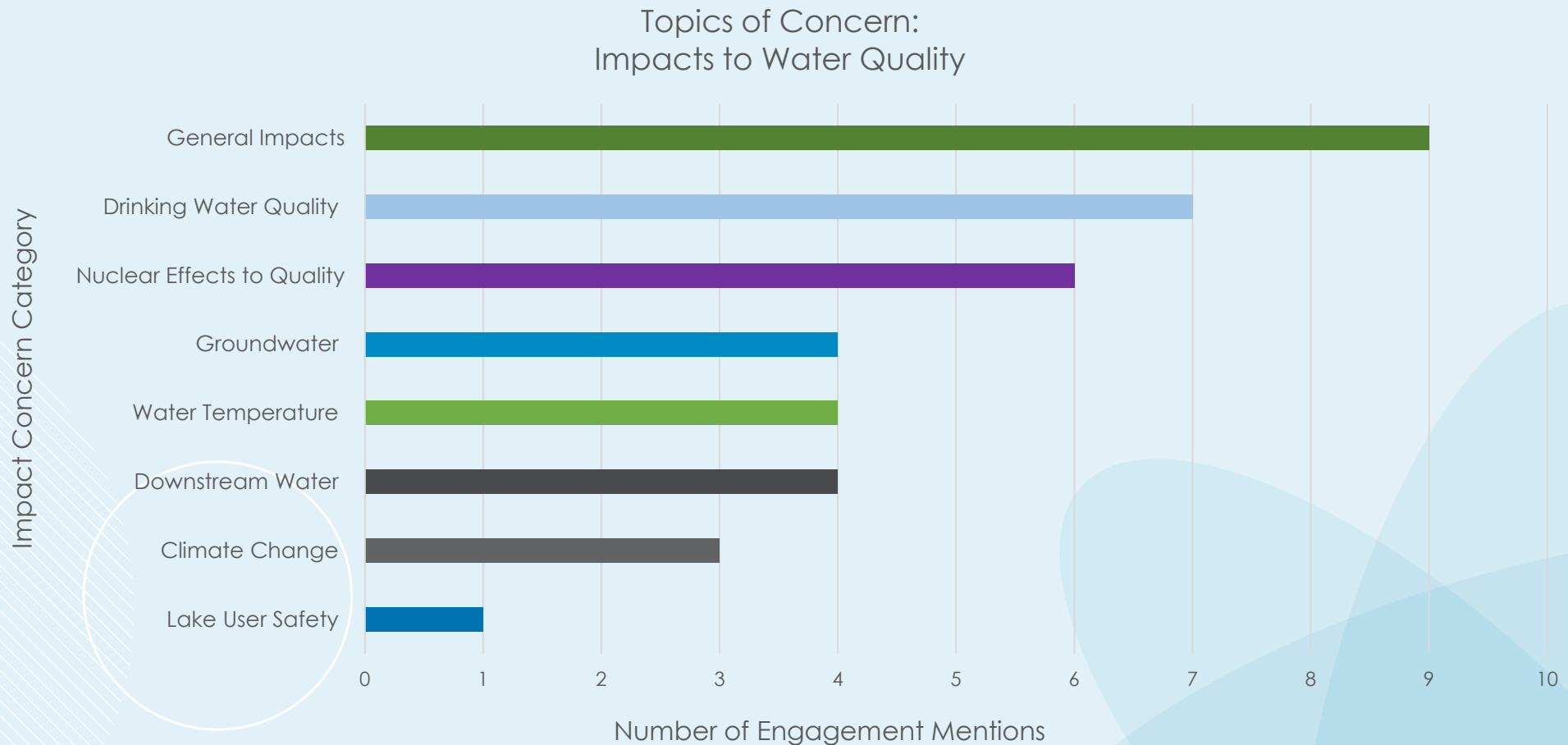
# Topics of Concern from Engagement: Water

Engagement activities showed water availability as a key topic of importance



# Topics of Concern from Engagement: Water

Engagement activities showed water quality as a key topic of importance



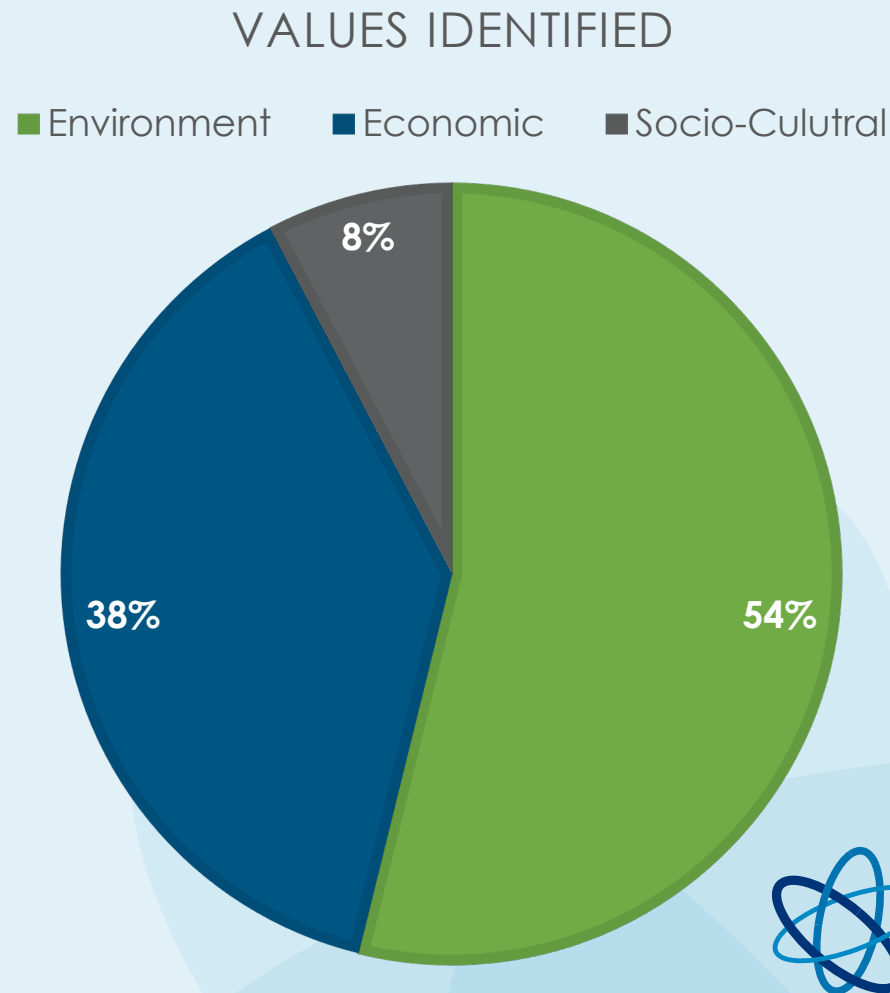
# What We Have Heard: Value Category Mentions

All mentions of water related values in comments, responses, or questions posed during SaskPower's engagement activities so far were tallied and organized into our three major value categories:

## Environment, Economic, and Socio-Cultural

This chart represents the percentage of mentions made per value category

→ Environment was the largest percentage at 54% of all mentions made



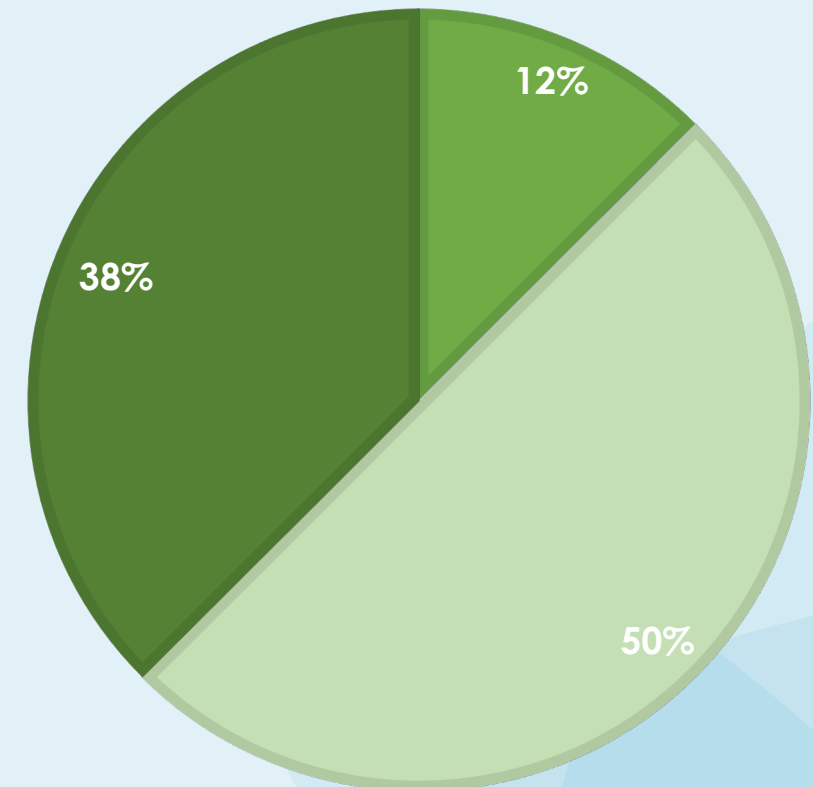
# What We Have Heard: Environmental Value Indicator Mentions

This chart represents the percentage of environmental value mentions made per indicator

→ **Water quality was the largest percentage of all indicators at 50% of all environmental value mentions**

ENVIRONMENTAL VALUES IDENTIFIED

■ Species ■ Water Quality ■ Water quantity



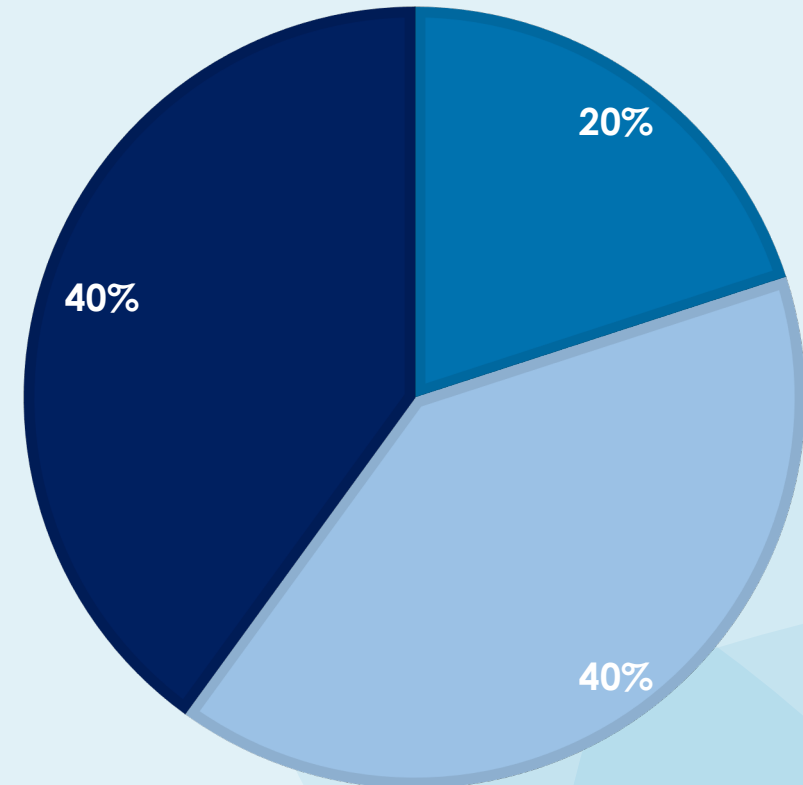
# What We Have Heard: Economic Value Indicator Mentions

This chart represents the percentage of economic value mentions made per indicator

→ Industrial and Agriculture were the **largest percentage of all indicators at 40% (each)** of all economic value mentions

ECONOMIC VALUES IDENTIFIED

■ Commercial Recreation and Tourism ■ Agriculture ■ Industrial Use





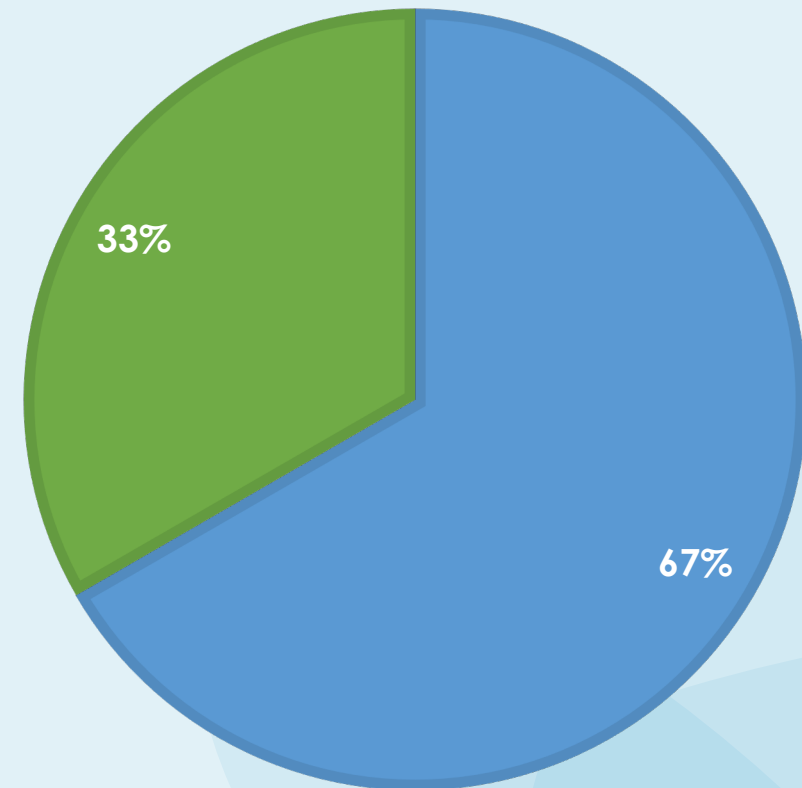
# What We Have Heard – Social and Cultural Values

This chart represents the percentage of socio-cultural value mentions made per indicator

→ Public recreation was the **largest percentage of all indicators at 67% of all socio-cultural value mentions**

SOCIO-CULTURAL VALUES IDENTIFIED

■ Public recreation ■ Spiritual Use (Indigenous and Non-Indigenous)



# How Engagement Results are being Used

**Engagement results will be used to aid in the development of our water valuation model in the following ways:**

- The interests and concerns documented through engagement helps us to focus on the water values of most importance
- Additional information on water values (e.g., online “places” tool) confirms our understanding of the water values present
- This helps us to:
  - 1) calibrate the model so that it is specific to the potential siting areas, and
  - 2) supplement the economic value estimates with contextual information
- The water valuation model results are then to be used, along with other studies, to support decisions on the identification of preferred sites for SMR development



\*Note that impacts to Aboriginal and Treaty rights will be considered in the siting decision through the consultation process

# Preliminary Results of the Water Valuation Survey



# Water Valuation Survey: Data Analysis



The Water Valuation Survey has now closed and the results are undergoing analysis



- The draft results presented today are consolidated responses for both the Estevan and Elbow potential siting areas
- This data provides an understanding of the overall values and priorities Saskatchewan stakeholders hold for water in their region
- Further analysis will occur to determine key values identified for each potential siting area, and to synthesize the extensive information provided

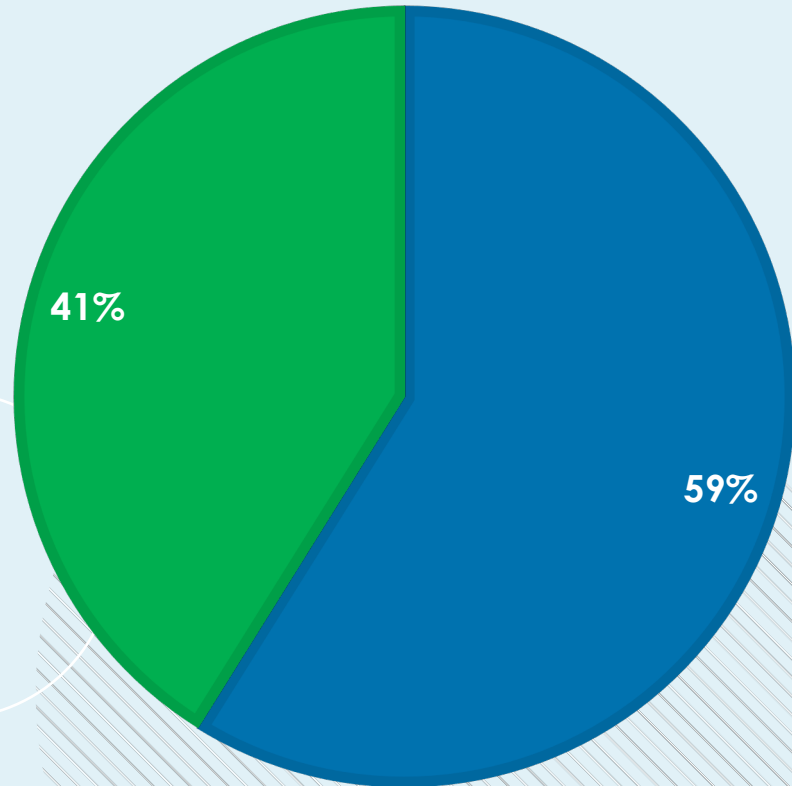


# Preliminary Survey Results: Potential Siting Areas



## SURVEYS COMPLETED FOR EACH SITING AREA

■ Estevan Siting Area (Map 1) ■ Elbow Siting Area (Map 2)



A higher percentage of those surveyed responded to the questions thinking about the:

### Estevan Potential Siting Area

#### # of responses:

- 368 for Elbow Potential Siting Area
- 527 for Estevan Potential Siting Area
- 894 total





# Preliminary Survey Results: Waterbodies



When asked what lakes and rivers visited in the Potential Siting Areas, responses consisted of the following:

## Lakes

- Lake Diefenbaker
- Nickle Lake
- Grant Devine Lake
- Kenosee Lake
- Elbow Lake
- Dead Lake
- Macdonald Lake
- White bear Lake
- Palliser Lake

## Dams

- Boundary Dam
- Rafferty Dam
- Gardiner Dam

## Bays

- Hitchcock Bay
- Outlook Bay
- Krogan Bay

## Rivers

- Souris River
- South Saskatchewan River
- Qu'Appelle River

## Creeks

- Long Creek
- Moose Creek

## Reservoirs

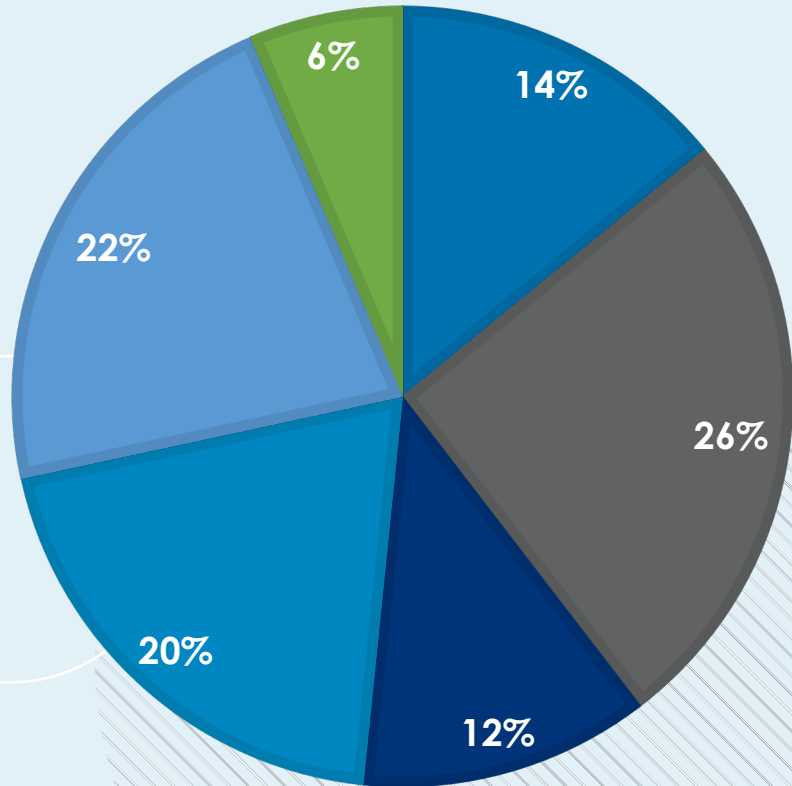
- Rafferty Reservoir
- Grant Devine Reservoir
- Alameda Dam Reservoir
- Avonlea Reservoir
- Broderick Reservoir



# Preliminary Survey Results: Water Use During Spring and Summer

## FREQUENCY OF VISITS TO THE SITING AREAS

■ Daily ■ Weekly ■ Bi-weekly ■ Monthly ■ Rarely ■ Never



The most common answer on level of frequency for waterbody visitations in the spring and summer is...

**Weekly**

The least common answer on level of frequency for waterbody visitations in the spring and summer is...

**Never**

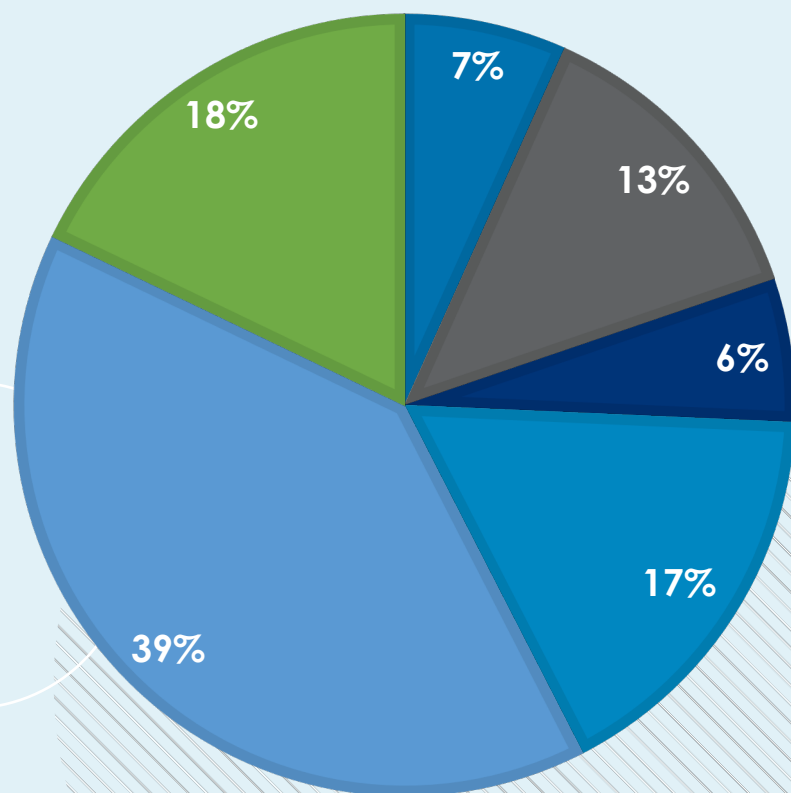
→ This is an average high frequency of waterbody use in the warmer seasons for those who participated in the survey



# Preliminary Survey Results: Water Use During Fall and Winter

## FREQUENCY OF VISITS TO THE SITING AREAS

■ Daily ■ Weekly ■ Bi-weekly ■ Monthly ■ Rarely ■ Never



The most common answer on level of frequency for waterbody visitations in the fall and winter is...

**Rarely**

The least common answer on level of frequency for waterbody visitations in the fall and winter is...

**Bi-weekly**

→ This is an average low frequency of waterbody use in the colder seasons for those who participated in the survey



# Preliminary Survey Results: Environmental Values

- **Fish and wildlife are very important** to people's use of the lakes and rivers
- **Consistent water levels** are important for access to lakes and rivers and the use of boats/watercraft, as are **predictable water levels from season to season**
- Results showed current **water quality is believed to be adequate** and noted that if this were to change that **it would affect use of the lakes and rivers**
- Respondents **strongly agreed with the importance of maintaining future water availability and quality**



# Preliminary Survey Results: Environmental Values

Results showed **no clear opinion** (“neither agree no disagree”) regarding:

- Observed changes in conditions of the lakes and rivers being **related to climate change**
- Changes to **water temperature affecting the way lakes and rivers are used**
- Existing **shoreline infrastructure being susceptible to storm damage**
- Concerns over **flooding in the region affecting use** of the lakes and rivers



# Preliminary Survey Results: Economic Values

- Respondents identified **power generation, agriculture (irrigation and livestock), and recreation and tourism** as the top industries connected to local lakes and rivers
- Responses expressed significant positive sentiment ("strongly agree" and "agree") towards the importance of water for tourism and recreation, **the most valued activities being fishing, watersports, and pleasure craft vessels**
- Other industries/ sectors identified as important users of water include **municipalities, mining, and oil & gas**
- Industries not discussed in the survey but that were brought forward as important users of water in the region include **aquaculture, the food industry, and health and emergency services**





# Preliminary Survey Results: Socio-Cultural Values

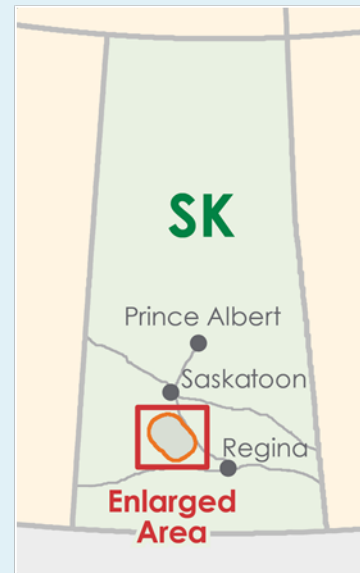
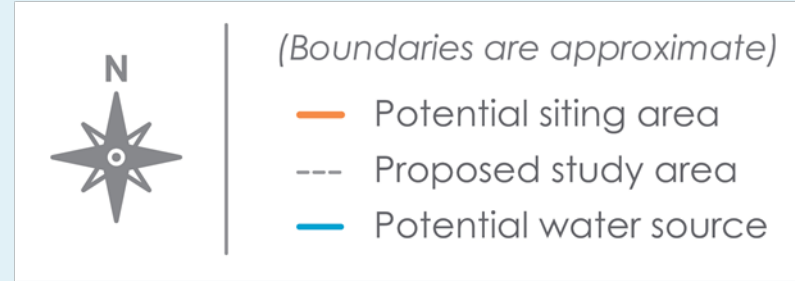
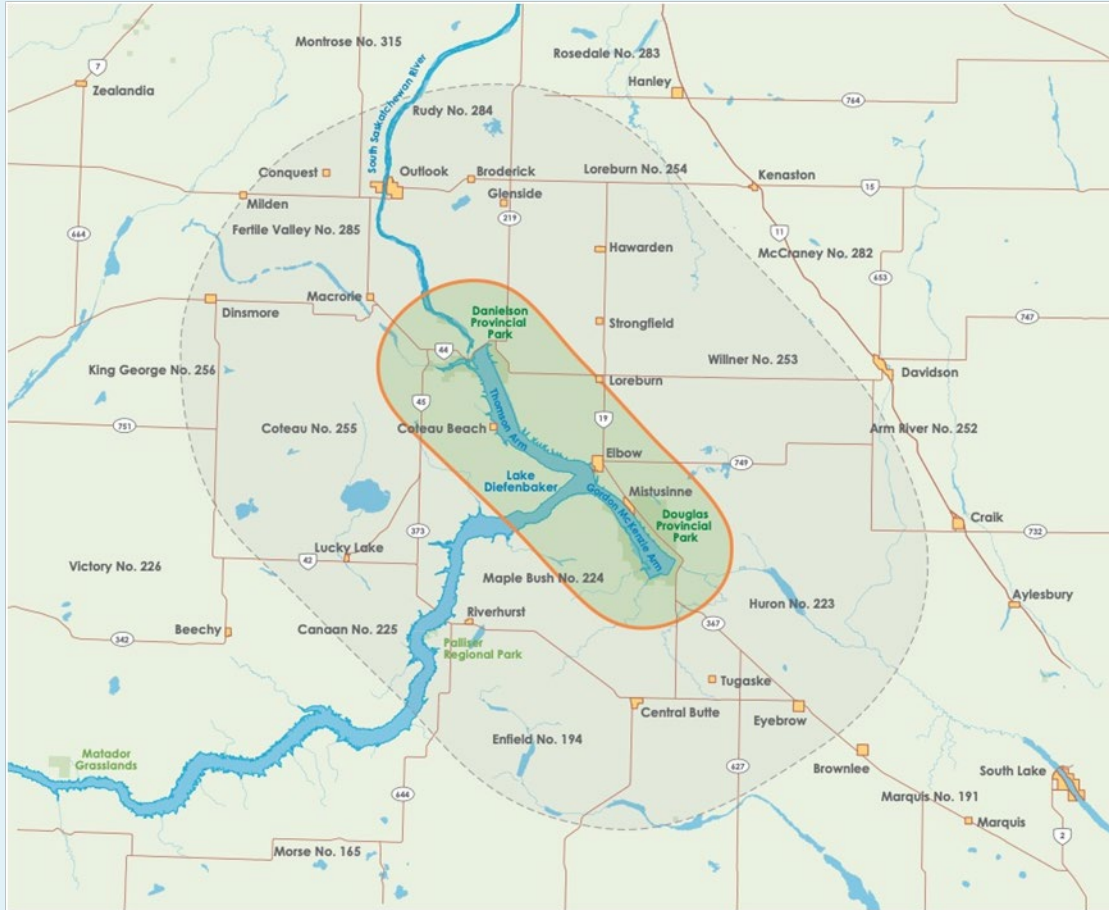
- Respondents identified the least with the socio-cultural questions regarding water over economic and environmental values
- Large majority responded that the lakes and rivers were **not part of their heritage or spiritual practices – additional work will be done to better understand these values**
- Most commonly respondents **were impartial** (“neither agree nor disagree”) to other questions **concerning personal culture and heritage values** associated with the lakes and rivers
- While culture was not heavily emphasized, **identity, sense of place and wellbeing** associated with the lakes and rivers were highly valued
- Importance of the lakes and rivers for **science, research and education** is also identified



# Identification of Existing Water Values



# Potential Siting Areas - Elbow



# Study Data Collection and Analysis

## Types of Water Values Being Considered

Environmental Values	Economic Values	Social and Cultural Values
<ul style="list-style-type: none"><li>• Water storage and moderation of flow</li><li>• Groundwater recharge</li><li>• Flood and storm protection</li><li>• Water quality and treatment</li><li>• Local climate regulation</li><li>• Erosion control and protection of shoreline</li><li>• Support for biodiversity (habitat and species)</li></ul>	<ul style="list-style-type: none"><li>• Power generation (thermal and hydroelectric)</li><li>• Irrigation agriculture</li><li>• Water for livestock</li><li>• Industrial use</li><li>• Municipal/ regional association water supply</li><li>• Commercial recreation and tourism</li><li>• Aquaculture</li><li>• Fisheries</li></ul>	<ul style="list-style-type: none"><li>• Public recreation</li><li>• Science and education</li><li>• Cultural use</li><li>• Heritage and spiritual values</li></ul>



# Identification of Existing Water Values: Elbow Potential Siting Area



# Environmental Values: Water Quality & Quantity

## Water Quantity

- Current water licensing is grouped into municipal/domestic, industrial/mining, agricultural, and recreational purposes
- Agricultural licence holders are currently the largest ground and surface water users in the Elbow Potential Siting Area
- Current water allocated under licence in the Elbow Potential Siting Area.

## Water Quality

- Water quality is determined by many factors. Temperature profiles, as one indicator of water quality, are currently obtained through concurrent thermal profile studies to determine present water quality
- Further quality indicators will be explored such as occurrence of algae blooms





# Environmental Values: Species and Habitat

The following water-based species/habitat was identified within the Elbow Potential Siting Area:

Key Fish Species

- Walleye
- White sucker
- Black/brown bullhead
- Yellow Perch
- Northern Pike
- Trout

✓ No Bigmouth Buffalo or Mountain Sucker within Estevan Potential Siting Area

Semi-Aquatic Species

- Northern leopard frog
- Western tiger salamander
- Great plains toad

Key Waterbirds

- Ducks
- Canadian Geese
- Crane

Rare/Endangered Species

- Dusky Dune Moth
- Burrowing Owl
- Gold Edged Gem
- Whooping Crane
- Piping Plover
- Lake Sturgeon
- Small flowered Sand Verbena

Federal Critical Habitat

- Smooth Goosefoot
- Slender Mouse Ear-Cress
- Western Spiderwort
- Gold Edged Gem
- Dusky Dune Moth

Wildlife Habitat

There is a total area of **31,548 hectares** of wildlife habitat within the Elbow Siting Area



# Economic Values

The following water-based economic values were identified within the Elbow Potential Siting Area:

## Active Mines

- ✓ No active mines in the Elbow Potential Siting Area

## Upstream Oil and Gas

- ✓ No active upstream wells in the Elbow Potential Siting Area

## Aquaculture and Fish Farming

- Wild West Steelhead Fish Farm
- ✓ Produces roughly **2,500 fish annually**

## Water Dams

- Qu'Appelle River Dam
- Gardiner Dam

## Industrial Agriculture

- Livestock watering program in Elbow

## Irrigation Agriculture

Key Crops ....

- Mustard Seeds, Canary Seed, Peas, Canola Seed, Chickpeas, Flax, Lentils.

**Note:** Water Security Agency has South Saskatchewan River Project in this area

## Power Generation

- Coteau Creek Hydroelectric Station(186 MW)
- Loreburn Heat Recovery (5 MW)
- ✓ Total power capacity of **191 megawatts**



# Commercial Tourism and Public Recreation

Commercial businesses included in the value inputs included services with access to local waterbodies such as canoeing, kayaking, fishing, boating, and camping near water.

## Key Elbow Commercial Recreation Businesses

- Sunset Beach at Lake Diefenbaker
- Fishinggeeks (Fishing Outfitters/Hunting Lodge/Resort)
- Hitchcock's Hideaway
- Lake Diefenbaker Fishing Charters – Fishing Outfitters
- Sandy Shores Marina
- Sarah's Cove Condo and Harbor Inn
- Elbow Sunset Suites and RV Park Ltd
- Tuffs Bay Campground
- Harbor Golf Club
- Coteau Beach
- Lucky Lake Heritage Marsh
- Prairie Lake Regional Park
- Prairie Lake Vacations
- Riverhurst Ferry
- Lucky Lake Campground
- Danielson Park Store (boating and fishing supplies for park visitors)
- Danielson Provincial Park
- Coldwell Recreation Site (Campground)
- Chief Whitecap Waterway (Water route)
- Gardiner Dam



✓ Estimated annual utilization(# of people) = **32,000 individuals**



# Social and Cultural Values

**The Water Valuation Study is currently conducting additional work to explore the importance of the following socio-cultural values for the Elbow Potential Siting Area:**

- Public recreation (previous slide)
- Public local education and science with waterbody engagement – Douglas Provincial Park has an outdoor education program that includes water-based learning
- Local cultural and heritage sites

**The economic modeling work will estimate these where feasible and important to the Potential Siting Area**



# Summary of Priority Values

## Environment

- **Species:** Rare/Endangered species (dusky dune moth, lake sturgeon, Whooping Crane, etc.)
- **Species:** 31,548 hectares of wildlife habitat located in study area
- **Species:** Federal Critical Habitat confirmed locations (e.g., western spiderwort)
- **Water:** Current water quality (thermal profile study)
- **Water:** Current water availability (water availability study and licence data)

## Economic

- **Commercial Recreation and Tourism:** Major source of tourism revenue and utilization with many water-based tourism attractions (Prairie Lake Regional Park and resort communities and estates on water)
- **Energy Production:** Loreburn Heat Recovery and Couteau Creek
- **Aquaculture:** Fish farm production at Steelhead Fisheries
- **Agriculture/Irrigation:** Irrigated crops (durum, chickpeas, and others)

## Socio-Cultural

- **Public recreation:** Many water-related activities and amenities made accessible to public (provincial, regional, and public parks)
- **Public education and science:** Educational services at Douglas Provincial Park - outdoor classroom programs
- **Cultural and Heritage sites:** In progress of exploring further

### Key value themes:

Water-based  
Tourism and  
Recreation

Species and  
Habitat

Aquaculture

Energy Production

Irrigation for  
Agriculture and  
Livestock



# Group Discussion/Questions



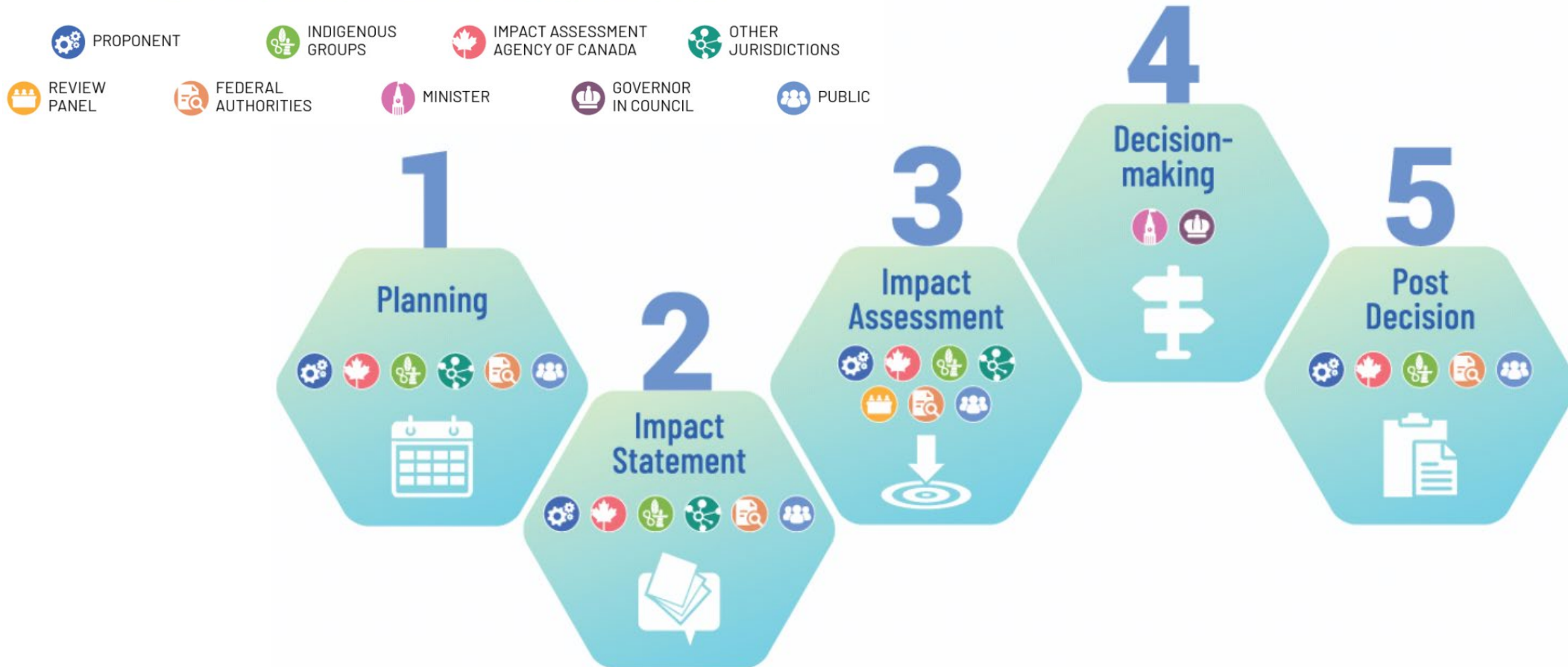


# Impact Assessment and Siting Studies Update



# The Impact Assessment Process

## KEY PARTICIPANTS IN THE IMPACT ASSESSMENT SYSTEM



# The Impact Assessment Process

## Proponent Lead Opportunities for Engagement Examples:

- 1) Valued Components
- 2) Alternative Assessments



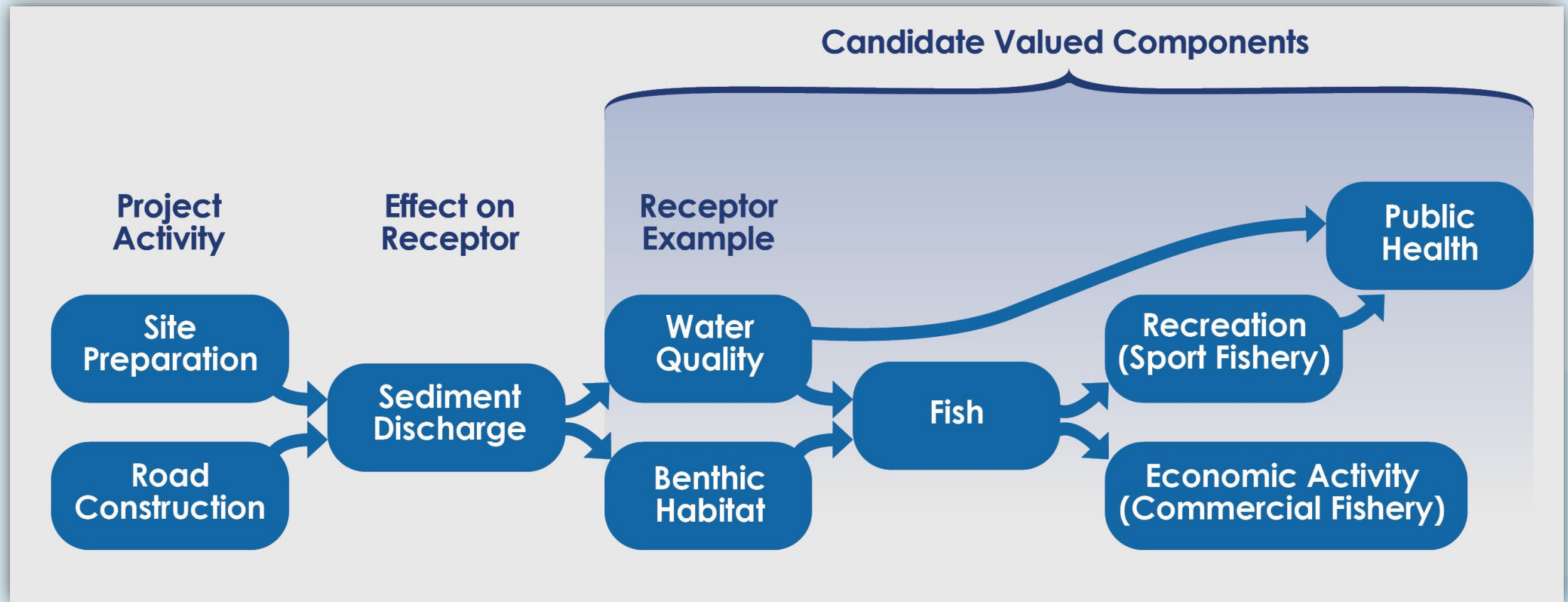
# Impact Assessment Process



## Valued Components

- Including environmental, health, social, economic and potentially other elements of the natural and human environment – Impact Assessment Agency of Canada
- Environmental Attributes identified as having legal, scientific, cultural, economic, or aesthetic value – Government of Saskatchewan

# Selecting Valued Components



# Potential Valued Component – REP Example

Assessment Factor	Valued Component	Valued Sub-Component
Aquatic Resources	Fish and fish habitat	Fish species (tourism / recreational value, e.g., Large-mouth bass)
		Select Fish Species - Indicators For Changes in Water Temperature/Thermal Impacts



# Menti Question – Valued Component

## Word Cloud



What fish species should be included as indicator species in the assessment?



# Potential Valued Component – REP Example

Assessment Factor	Valued Component	Valued Sub-Component
Terrestrial Environment	Species at Risk	Select SAR indicator species

# Menti Question – Valued Component

## Word Cloud



What Species at Risk should be included as indicator species in the assessment?



# Potential Valued Component – REP Example

Assessment Factor	Valued Component	Valued Sub-Component
Terrestrial	Wildlife	Mammals – Select Indicator Species

# Menti Question – Valued Component

## Word Cloud



What mammal species should be included as indicator species in the assessment?



# IAA Alternative Assessments

Refers to both “Alternatives to” and “Alternative means:

- **“Alternatives to” the project** – functionally different ways to meet the need for the project and achieve its purpose that are technically and economically feasible
- **“Alternative means” of carrying out the project** – various technically and economically feasible ways, including through the use of best available technologies (BAT), which would allow a designed project and its physical activities to be carried out



# Alternatives Means – Current Studies



**The IAA Impact Statement Guidelines Section 3.4 provide a list of project elements where alternative means must be considered**

Many alternative means are related to later design stages, but some current work will inform alternative means assessment

- Project Site Location
  - Siting work is ongoing
  - Estevan and Elbow Study Areas are under consideration
- Water Cooling Technologies
  - Cooling options are under consideration
  - Once-through cooling, various cooling tower options





# Menti Question – Alternative Assessment



What do you think are the most important benefits SaskPower should consider in evaluating alternatives?

- A) Greenhouse Gas Emission Reductions
- B) Local Economic Development
- C) Energy Independence
- D) All the above equally



# Siting Studies Update



# Siting studies update

## Current Siting Related Technical Investigations

Field Work Progress: Water Field Studies, ADCPs & equipment deployed

Water Intake

Thermal Modelling

Future Water Availability/Allocation Modelling

Seismic/Faults/Hydrogeology/Geophysical

Transmission

Transportation

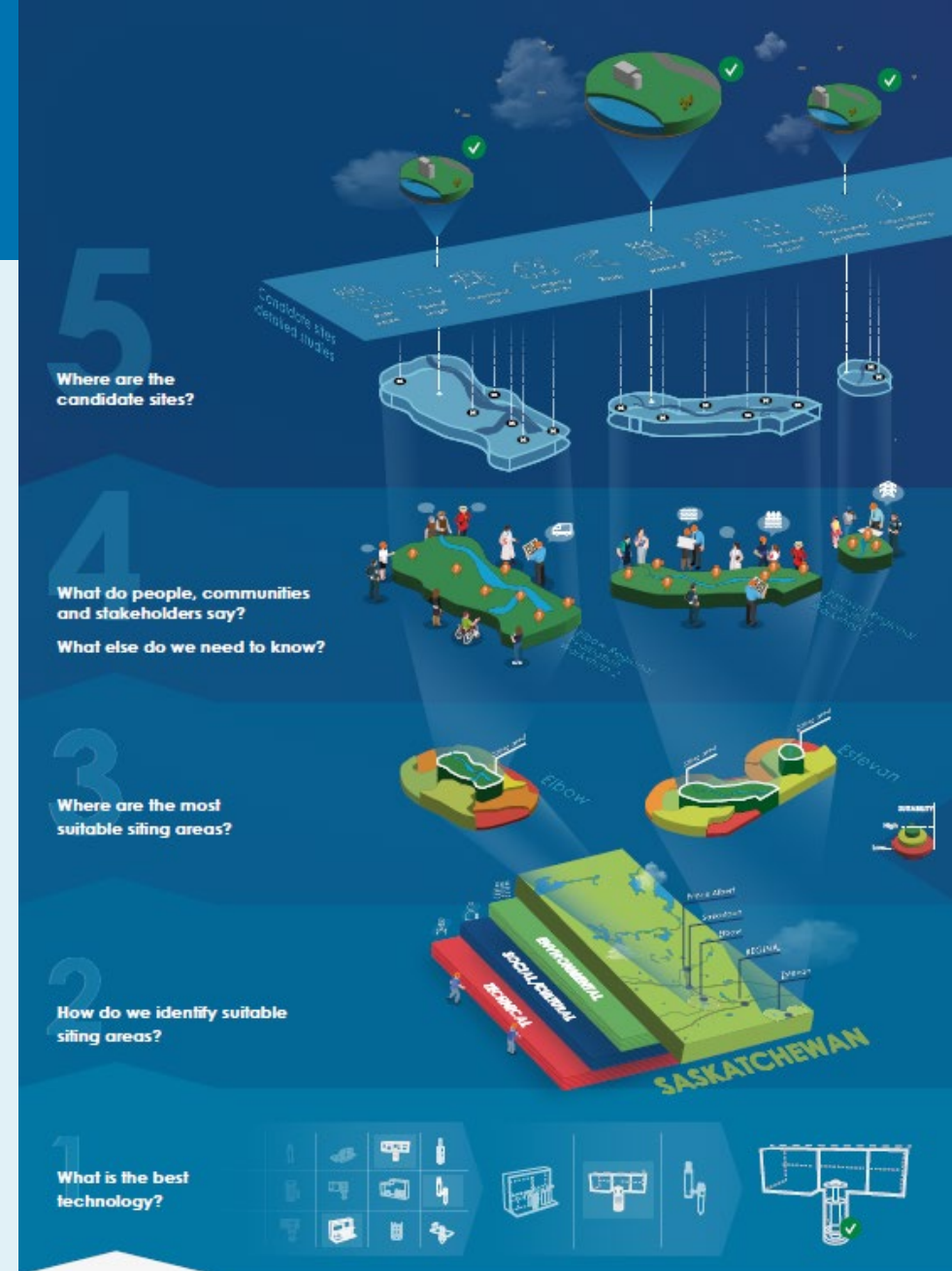
Terrain

Meteorological and Atmosphere

Aquatic & Terrestrial desktop studies

SaskPower Lands Group input to siting considerations

SaskPower Review of Proximity to US Border



How does the  
**SITING PROCESS WORK?**

# Field Work Studies, ADCP's, Equipment Deployed

## Component #1: Rafferty and Grant Devine Reservoir

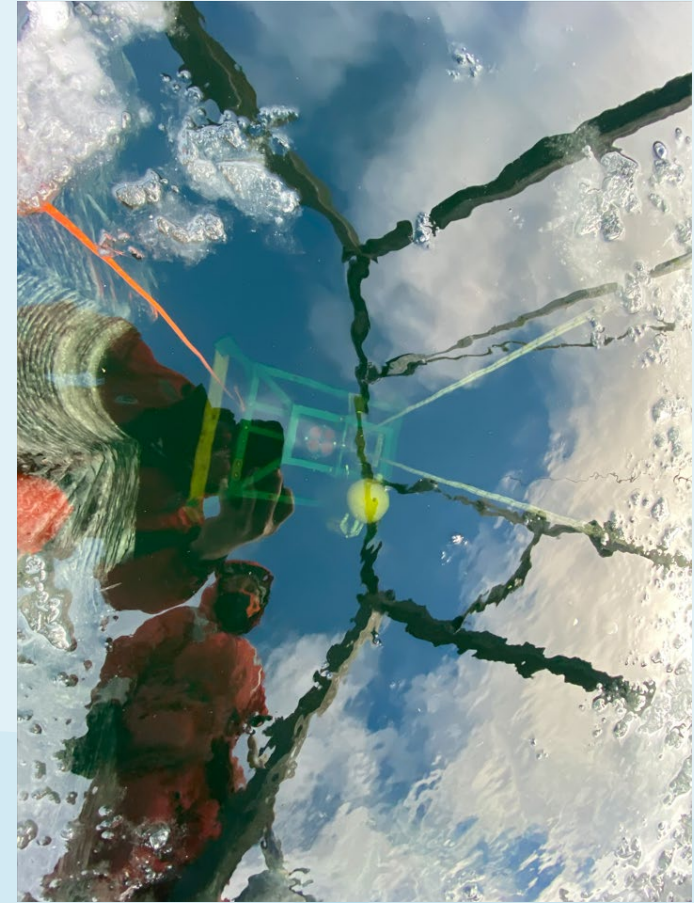
- Completed (21 January to 25 January)

## Component #2: Lake Diefenbaker

- Completed (15 February to 22 February)

## Component #3: Boundary Reservoir

- Completed (23 February to 28 February)



# Water Intake

A multi-step approach used to identify promising candidate areas included the following steps:

- 1. Pre-field Base Mapping**
  - 2. Initial Field Site Inspection**
  - 3. Development of Water Intake Local Siting Areas**
  - 4. Initial GoldSET Spatial Water Intake Suitability Model**
- Currently developing location options
    - Lake Diefenbaker
    - Rafferty Reservoir
    - Boundary Reservoir
  - Comparisons among siting options for developing the short-list of sites: Spring/Summer 2023



# Other Water Related Studies

## Thermal Modelling

- Detailed implementation plan developed
- Topo-bathymetric surfaced prepared by GIS for use in model
- Interface with Water Intake Scope to establish design concepts for intakes and outfall

## Future Water Availability

- Hydrological models developed for Upper Souris River and South Saskatchewan River Basin
- Climate change scenarios developed
- Currently working on naturalized flow records from WSA and AEP
- Currently working on allocations data

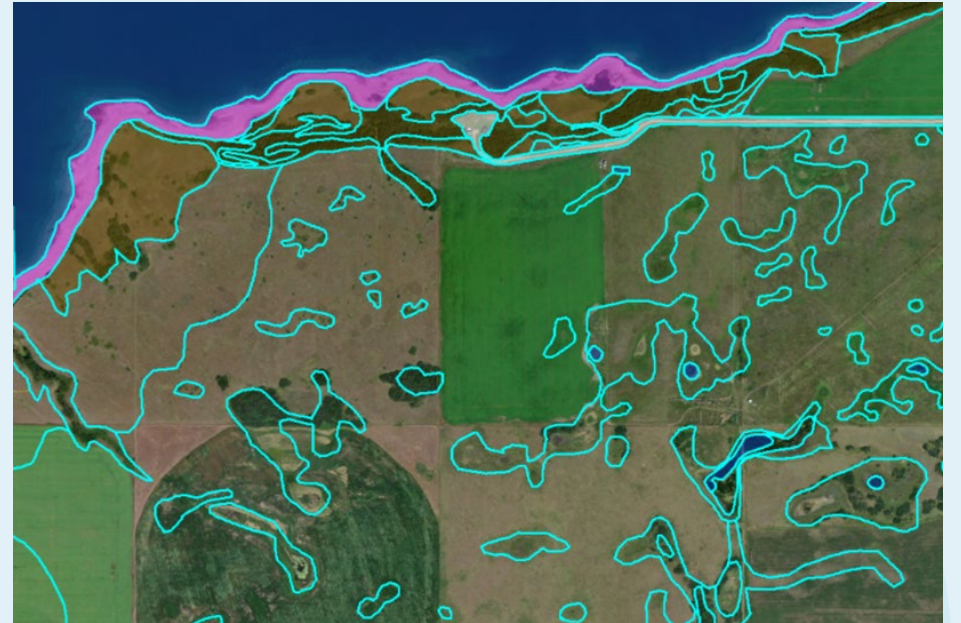




# Terrain

## Terrain mapping and geohazard assessment

- Mapping has been focused on water intake local siting areas, plus a 3 km buffer inland
- Findings will contribute to Geotechnical and Hydrogeological assessments
- Comparisons among siting options for developing the short-list of sites: Spring/Summer 2023





# Transmission

- SaskPower completed an Interconnection Exploratory Study for an SMR interconnection in the Estevan and Elbow siting areas (early planning level study with many assumptions).
- Considered several interconnect options related to switching stations, existing or new, and radial lines
  - Key assumption – 1 new 230kV radial line required for each 300MW SMR



# Transportation

- **Phase 1 transportation study nearing completion**
  - **Focused on review of transportation systems in proximity to the siting areas including:**
    - Rail lines
    - Airports
    - highways including highway surface types and weight classifications
    - Review of adjacent communities and key features related to transportation (e.g., locations of existing schools, emergency services, hospitals)
  - Initial findings will contribute to comparisons among siting options for developing the short-list of sites: Spring/Summer 2023
  - More detailed work will be required to generate cost comparison information to support narrowing site selection down to 2 preferred options



# Other Technical Studies and Inputs

- **Seismic and Faults**
  - Phase 1 desktop study to define various site ground conditions and capable faults
  - work nearing completion
- **Hydrogeology/Geophysical**
  - Phase 1 regional desktop study utilizing terrain mapping and water intake alternatives
  - Aquifers, depth to bedrock, geohazards, slope/setback will be added to the geospatial data to be used as an indicator in GoldSET
  - Results available for evaluating the short-list of sites: Spring/Summer 2023
- **Meteorological and Atmosphere**
  - Existing information of air, noise and visual conditions review initiated
  - Results available for evaluating the short-list of sites: Spring/Summer 2023
- **Aquatic & Terrestrial desktop studies**
  - Existing information review for ecosystem, habitat and biota information and water and sediment quality initiated
  - Results available for evaluating the short-list of sites: Spring/Summer 2023
- **SaskPower Lands Group input to siting considerations**
- **SaskPower Review of Proximity to US Border**
- **SaskPower Review of Heritage and Archaeological review**
- **Existing Asset Review**
  - Input available for comparisons among siting options for developing the short-list of sites: Spring/Summer 2023



# QUESTIONS

# Break Number Two – Lunch 30 min



# Nuclear Waste Panel



# Regional Identity





# Elbow Regional Vision Statement #1

**Centred on stewardship of our natural resources while honouring our cultural legacy, our community will promote sustainable growth and development; harmonizing opportunities for economic prosperity, and recreation.**

# Elbow Regional Vision Statement #2

**Honouring and protecting our natural resources as we grow our community; one that is centred on sustainable economic growth, leadership in clean energy development and stewardship of our waters for future generations.**

# Elbow Regional Vision Statement #3

**Our region is a top destination in Saskatchewan for recreational activity, with a rich cultural history and legacy of environmental stewardship.**

**Together, we will foster sustainability and economic growth that compliments our existing community, industry, and leads to prosperity for generations.**

# Break Number Three – 15 min



# Social and Economic



# Conference Board of Canada – 2021 Study

## Summary of Study:

### **2021 – 2036 Planning Phase:** (Expected to Generate 180 Jobs\*)

- Types of Jobs: engineers & technical support, environmental technicians.

### **2029 – 2042 Construction Phase:** (Expected to Generate 1760 Jobs\*)

- Standard Construction Trades: carpenters, sheet metal workers, millwrights, pipefitters, electricians, ironworkers, construction operators, scaffolders.

### **2033 – 2099 Operating Phase:** (Expected to Generate 730 Jobs\*)

- Types of Jobs: licensed nuclear operators, non-licensed operators, chemistry technicians, maintenance technicians (mech, elec, I&C), fuel technicians, environmental technicians, utility staff, radiation technicians, engineering & technical support, security staff.

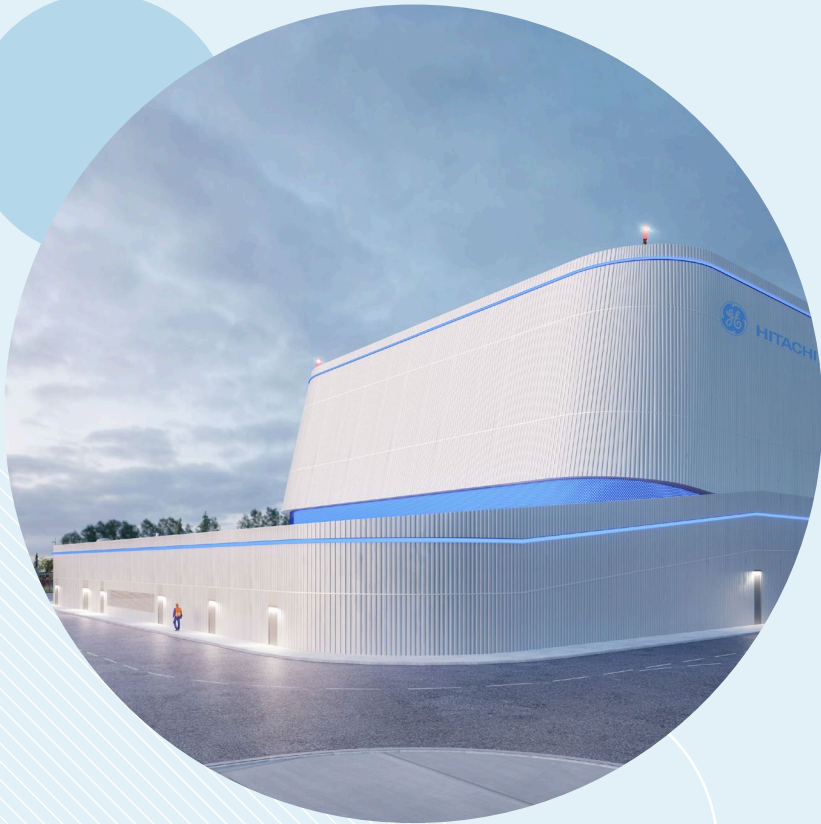
\*The Conference Board of Canada 2021 study was based on deployment of four SMR's, with an output of approximately 1,200 MW of nuclear power



# Economic Impact Study - 2023

## Summary:

- Construction and operation of one SMR.
- Consider different demographic and economic features.
- Collect input from local Chamber of Commerce and/or economic development organizations to inform the data collection and analysis.





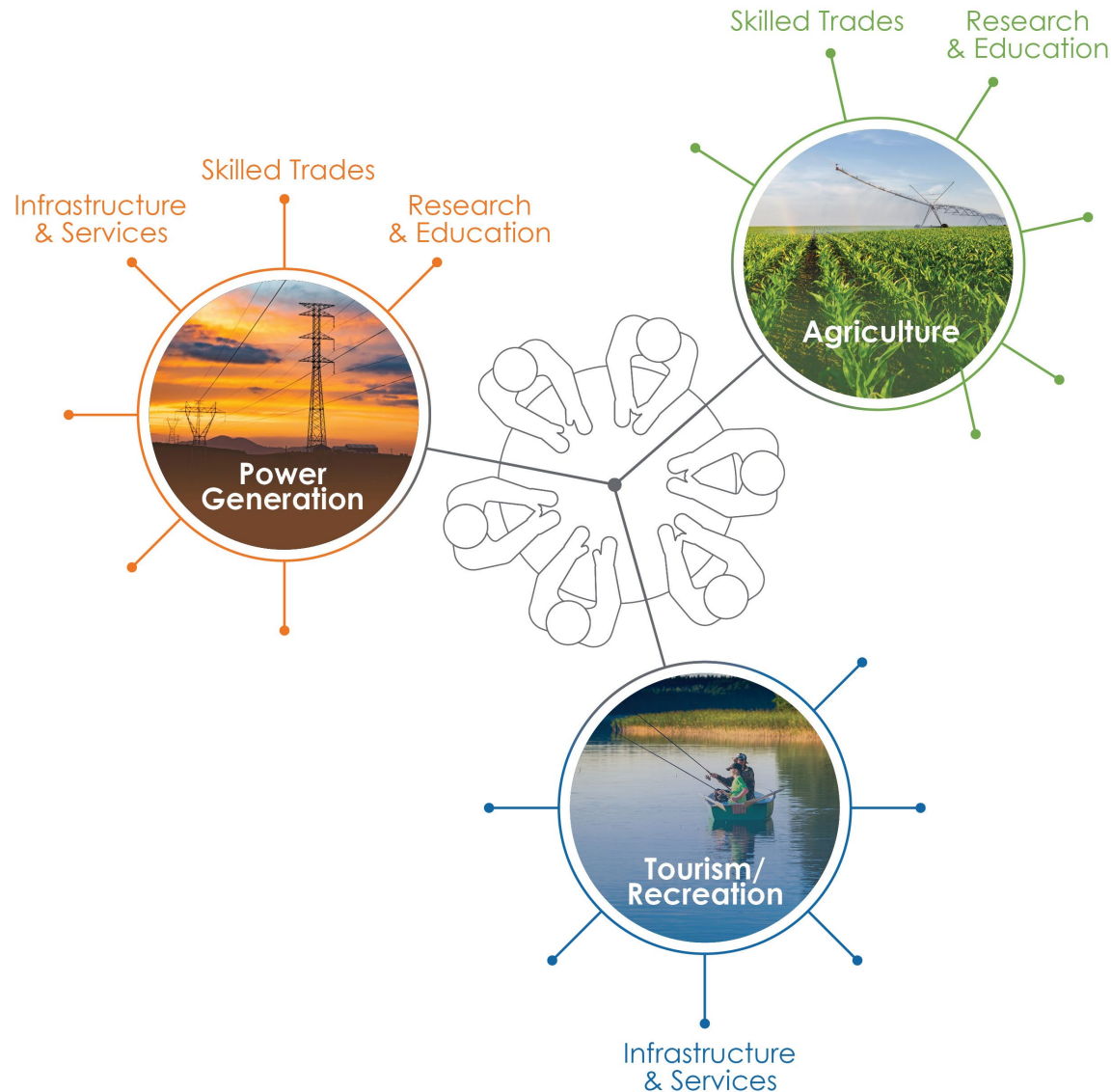
# Scope informed by engagement

Questions we've heard through engagement.

- Would an SMR in Elbow lead to a reduction in tourism?
- Or will the new jobs increase economic activities in hotels and restaurants?
- Do large industrial projects impact the quality and supply of services through construction and operation?
- Would an SMR in Estevan replace the tax revenue from coal operations?
- After the construction is complete, what is the likely employment and how could this impact the immediate and surrounding communities?



# Exercise: Vision for Economic Opportunities



# QUESTIONS

# Wrap Up and Next Steps



# Wrap Up and Next Steps

**Feedback Form**  
Regional Evaluation Process - Workshop No. 3

Please use the prepaid envelope provided to send this feedback form to us after completing. You can also send a picture of it to: [PublicEngagement@saskpower.com](mailto:PublicEngagement@saskpower.com).

Rank each statement from 1 to 5 on the right column. 1 = Strongly Disagree, 5 = Strongly Agree.

Rank each statement from 1 to 5 on the right column.	1	2	3	4	5
I see the committee's input and feedback reflected in the topics presented & materials provided.					
I have a better understanding of how nuclear waste is managed in Canada.					
I understand that I have future opportunities to shape and contribute to the impact assessment.					
I see the committee's input reflected in how SaskPower updated the regional siting criteria and suitability maps.					
I see how the survey we participated in during last workshop is being used to help SaskPower understand how water in study areas are valued.					

**Tell us about your experience.**

	Yes	No	Not sure
I appreciate that the committee will be receiving a digital copy of the SEP report Draft 2 (vs. printing a copy for me).			
Panel discussions are an effective way for me to learn about complex topics like nuclear fuel and managing waste.			
Was the information provided helpful?			
Was participating today a good use of your time?			

**Tell us what you'd have preferred if you answered "No" or "Not sure" to any of the questions above.**

Rank each statement from 1 to 5 on the right column. 1 = Strongly Disagree, 5 = Strongly Agree.

Rank each statement from 1 to 5 on the right column.	1	2	3	4	5
SaskPower is working hard to learn how this project might affect me/my business before moving forward.					
SaskPower will use stakeholder feedback to the greatest extent possible.					
SaskPower is openly sharing all relevant information about this project.					
I find it easy to give feedback to SaskPower.					
I trust SaskPower as a reliable source for information on electricity.					
I'm confident in SaskPower's approach to planning Saskatchewan's power future.					

Any additional comments:

Page 1 of 1

## Our Ask to you:

- Complete our exit survey - hand in before you leave
- Promote and encourage participation in our Drop-in events over the month
- Confirm attendance for Workshop #4
  - Elbow May 16
  - Estevan May 18

# THANK YOU

Project website: [saskpower.com/nuclear](https://saskpower.com/nuclear)

