4/25/2025

Mr. Kristopher Keller
City of Dickinson
38 1st Street W
Dickinson, ND 58601

Re: Change Order to Agreement for Dickinson Manns Dam Feasibility Study

Dear Mr. Keller:

This letter sets forth changes to the Agreement dated 2/20/2025 between the City of Dickinson (Client) and Barr Engineering Co., its affiliates and subsidiaries (Barr) regarding engineering assistance for completing a feasibility study for the Manns Dam (Project #202508)).

The scope of professional consulting services Barr will provide is modified to include the additional work outlined in the attached scope of work dated 2/21/2025.

The authorized cost for the revised scope of services is increased by $103,465, as outlined in the table below.

Item	Amount
Original Project Budget	$5,000
Anticipated Extra Work	$103,465
Revised Project Budget including Contract Amendment	$108,465

If this Change Order to our Agreement is satisfactory, please sign the enclosed copy in the space provided, and return it to us.

Sincerely yours,

BARR ENGINEERING CO.

Jon D Ausdemore, PE
Its Vice President

Accepted this _____ day of _____, 20____

CITY OF DICKINSON

By _____

Its _____

Attachments
City of Dickinson – Manns Dam Feasibility Study: Scope, Schedule, and Budget, dated 2/21/2025

2/21/2025

Mr. Kristopher Keller
City of Dickinson
38 1st Street W
Dickinson, ND 58601

Re: City of Dickinson – Manns Dam Feasibility Study: Scope, Schedule, and Budget

Dear Mr. Keller:

This letter outlines the anticipated scope, schedule, and budget for the completion of a feasibility study for the Manns Dam (Project #202508), a low head dam located on the Heart River on the southwest side of the City of Dickinson. This effort is based on the original scope outlined by the City in an email dated 2/5/2025, Barr's past experience completing similar studies, several follow-up conversations, and input from a stakeholder meeting held on 2/14/2025. The feasibility study will consist of Kickoff and Data Gathering, Alternatives Concept Designs, and 30% Design of the Selected Alternative.

Future engineering consulting services on the project, which are anticipated to include final design, permitting, bidding assistance, and construction assistance, will be contracted separately at a later date and are not included in this scope of work.

1 Scope

1.1 Kickoff and Data Gathering

Job 1 will consist of kicking off the project, gathering and reviewing existing data, and collecting additional information needed to prepare preliminary designs to repair or replace the dam.

1.1.1 Review Existing Data

Barr has performed some initial data review of files shared by the city and the North Dakota Department of Water Resources (NDDWR) dams group. However, there may be additional information or files that would be relevant to this scope of work, including requesting the approved FEMA 1-D HEC-RAS hydraulic model of the Heart River from the NDDWR floodplain group. We have included a scope item here to complete a more thorough review of existing and any new data. This may include past hydraulic modeling, the original plans, past dam inspection reports, photographs, and survey data.

Deliverables: copies of existing data that is collected; list of available data

1.1.2 Kickoff and Site Visit

Following a review of the data, up to three Barr staff will attend a hybrid (virtual/in-person) kickoff meeting with City staff and any key stakeholders the City would like to include. We assume one Barr staff will be in-person (assuming travel from Bismarck) at the kickoff meeting and we will also conduct a site visit to the Manns Dam to review the condition of the dam and familiarize ourselves with the project area to further inform the alternative development.

Since a stakeholder meeting has already occurred that included introductions of key team members and input for big picture objectives, the kickoff meeting with the City will be focused on specific City objectives, our process for communications, data sharing and storage, City expectations, and a review the project scope and schedule.

Deliverables: kickoff meeting minutes; site visit and brief summary memo

1.1.3 Survey

For the feasibility study, we will leverage the available Stark County LiDAR data, information on channel bathymetry/cross sections from the effective FEMA hydraulic model, and other survey data to be collected by the City of Dickinson to support the Queen City Dam EAP project (City Project #202310), as available. However, Barr will be working with Civil Science on the collection of other specific survey data around Manns Dam to inform the alternative development for the feasibility study. This additional survey will include completing a utility locate request and survey of utility locations around the existing dam upstream to the first golf course bridge crossing. We will also collect approximate sediment depths approximately every 50-feet upstream of the existing dam to the first golf course bridge to better understand impacts if the dam is moved upstream.

See the attached details survey scope of work from Civil Science.

Deliverables: AutoCAD Civil3D file of survey data; PDF of drawing showing survey data collected

1.2 Alternative Concept Design

This job will consist of preparing concept (10% completion) designs for up to four alternatives to replace existing dam. The alternatives as defined below were based on a stakeholder meeting held on 2/14/2025 with representatives of the City of Dickinson, Dickinson Parks and Recreation, North Dakota Game and Fish, United State Bureau of Reclamation (USBR), Stark County Water Board, and a private resident who lives closes to the dam. Based on the conversation, repair of the dam given the existing conditions is not recommended and removal of the dam (and associated upstream pool) was not desired based on the feedback received from the stakeholders.

For preparation of this scope of work, the four alternatives to be considered were assumed to be:

1. Replacement of the dam with a rock arch rapids structure, existing location
2. Replacement of the dam with a rock arch rapids structure, upstream location
3. Structural replacement, existing location
4. Structural replacement, upstream location

The alternatives will also consider a concept for integration of the upstream golf course bridge replacement as requested by Dickinson Parks and Recreation and all concepts will include considerations for the drawdown of the upstream pool that will allow for the annual inspection of infrastructure associated with the Dickinson Dam as requested by the USBR.

The Alternatives Concept Designs will be composed of the following tasks:

1.2.1 Hydraulic Modeling

For each alternative, we will perform preliminary hydraulic modeling to assess potential water level impacts. We will leverage the existing effective FEMA 1D HEC-RAS model of the Heart River and update the model around the Mann’s Dam based on more current data that is available and any survey data that

is collected. This model will extend upstream to the Dickinson and Queen City Dams and will extend downstream to the State Avenue bridge crossing.

The model will use a preliminary representation of the dam geometry under each of the four alternatives. We assume that the discharge conditions for events ranging from the 10% annual chance to the 0.2% annual chance probability (e.g. 10-year, 100-year, and 500-year) floods will be taken from the effective FEMA Flood Insurance Study (FIS) for Stark County (dated August 2024). We will include a low-flow estimate based on available gage records and/or watershed assessment to determine the maximum water surface lowering that would be expected with any of the evaluated options.

Deliverables: the hydraulic modeling will be summarized in the memorandum and presentation in Tasks 1.2.4 and 1.2.5/1.2.6, respectively

1.2.2 Design and Drawings

Barr will prepare a plan and profile drawing for each of the four alternatives in AutoCAD Civil3D.

Deliverables: PDF plan and profile drawing for 4 alternatives

1.2.3 Cost Estimates

Barr will prepare a cost estimate for each of the four alternatives. Cost estimates will be Class 4 estimates per ASTM E2516 and have an expected accuracy range of approximately +40% / -20%.

Deliverables: cost estimates for 4 alternatives

1.2.4 Memorandum

Barr will prepare a draft memorandum summarizing the alternatives analysis, including discussion of hydraulic modeling, impacts to water surface elevations, site use and recreational considerations, cost estimates, a list of anticipated permits, discussion on potential funding sources, and pros and cons of each alternative. Barr assumes one round of comments from City staff and will finalize the memorandum, including discussion of the selected alternative by the City (in consultation with other stakeholders and Barr).

Deliverables: draft and final summary memorandum (PDF format)

1.2.5 Meetings and Updates

Barr will provide biweekly progress reports via email to the client contact and will include completed, current, and upcoming tasks, budget progress and management to date, action items, and any issues or concerns for the City. Additionally, we plan for up to 3 virtual monthly progress meetings (Microsoft Teams) during the alternative development task. Barr's PM will host the meeting and will include key team members relevant to the agenda topics.

Additionally, based on the conversation with the stakeholders on 2/14/2025, we assume we will hold two virtual stakeholder meetings during the alternative development and evaluation phase. We assume the stakeholder meetings will continue to include City of Dickinson staff, Dickinson Parks and Recreation, Stark County Parks and Recreation, Start County Water Board, North Dakota Game and Fish, the United States Bureau of Reclamation, and the nearest private landowner.

The first stakeholder meeting will be to discuss the assumed components of the four alternatives before we spend time fully developing each concept. This will make sure we accurately capture alternative locations, integration of the upstream golf course bridge replacement, and considerations for the drawdown of the upstream pool that will allow for the annual inspection of infrastructure associated with the Dickinson Dam.

The second stakeholder meeting will review and discuss the 10% design for each of the four alternatives with other project stakeholders and seek input on the selection of the preferred alternative to move into the next phase of design and finalizing the memorandum.

Deliverables: meeting agendas and minutes; email updates on project status; monthly virtual check-in meeting with City staff

1.2.6 Presentation to City

Barr will prepare a PowerPoint presentation summarizing the alternatives analysis, stakeholder and public input, and present the findings to the City Commission in one (1) virtual meeting.

Deliverables: PowerPoint presentation summarizing alternatives analysis

1.3 30% Design of Selected Alternative

Following the presentation of the 10% design memorandum, it is assumed the City (in consultation with other stakeholders and Barr) will select a single preferred alternative to be developed to a 30% design level. The 30% design will be composed of the following tasks:

1.3.1 Hydraulic Modeling

Barr will refine the hydraulic model for the selected preferred alternative to determine preliminary structure sizing, including rock and/or boulder materials if required, design any needed scour protection and/or bank stabilization measures, and evaluate potential impacts on water levels.

Deliverables: the hydraulic modeling will be summarized in the memorandum and presentation in Tasks 1.3.4 and 1.3.4, respectively

1.3.2 Design, Drawings, and Rendering

Barr will advance the design and prepare more detailed drawings of the selected alternative using AutoCAD Civil3D. These drawings will provide more detail than the 10% design drawings, bringing them to ~30% design, but will not be construction or permitting ready. We will prepare an artistic rendering of the selected alternative, to provide the City and public a clearer perception of what the completed project will look like.

Deliverables: PDF’s of up to 5 drawings of the selected alternative; PDF of artistic rendering of the selected alternative

1.3.3 Cost Estimate

Barr will provide an updated and more detailed cost estimate for the selected alternative. The cost estimate will be a Class 3 estimate per ASTM E2516 and have an expected accuracy range of approximately +30% / -15%. We will also provide cost estimates for final design, permitting, bidding assistance, and construction engineering for the project.

Deliverables: cost estimate for selected alternative

1.3.4 Memorandum

Barr will update the memorandum prepared in the alternative concept design task to reflect the additional work completed in in the 30% design development. We will also include next steps and anticipated timing for completion of the project in this memorandum.

Deliverables: updated summary memorandum

1.3.5 Meetings and Updates

Barr will provide biweekly progress reports via email to the client contact and will include completed, current, and upcoming tasks, budget progress and management to date, action items, and any issues or concerns for the City. Additionally, we plan for up to 3 virtual monthly progress meetings (Microsoft Teams). Barr's PM will host the meeting and will include key team members relevant to the agenda topics.

Additionally, based on the 2/14/2025 stakeholder meeting and follow-up conversation with City staff, we assume there will be one in-person public meeting to present the selected alternative to the public and gather additional feedback to inform next phases of design. We assume up to one Barr staff will attend this public meeting and prepare materials for the event, and that City staff will coordinate location and advertising for the public meeting.

Deliverables: meeting agendas and minutes, email updates on project status; monthly virtual check-in meeting with City staff; Presentation, boards and handouts for public meeting

1.3.6 Presentation to City

We will prepare a PowerPoint presentation summarizing the 30% Design and present the findings to the City Commission in a virtual meeting. We will include a recommendation of next steps and anticipated timing for completion of the project in the presentation.

Deliverables: PowerPoint presentation summarizing the 30% Design and recommended path forward.

2 Schedule

We have assumed we will receive Notice to Proceed on this project by June 1, 2025. The anticipated schedule to complete the various Jobs and Tasks identified in Section 1.0 of this document are summarized in Table 1.

Table 1. Anticipated Schedule

Job	Milestone	Estimated Completion Date
Kickoff and Data Gathering	Notice to proceed (assumed)	6/1/2025
	Review Existing Data	6/8/2025
	Kickoff Meeting (Hybrid) & Site Visit	6/22/2025
	Survey	7/4/2025
Alternatives Concept Designs	Hydraulic Modeling	8/3/2025
	Stakeholder Meeting #1 (Virtual)	7/13/2025
	Design and Drawings	9/7/2025
	Cost Estimates	9/14/2025
	Memo	9/28/2025
	Stakeholder Meeting #2 (Virtual)	10/5/2025
	Presentation to City (Virtual)	10/18/2025
30% Design of Selected Alternative	Hydraulic Modeling	11/1/2025
	Design and Drawings	11/22/2025
	Cost Estimates	11/29/2025
	Memo	12/13/2025
	Public Meeting (In-Person)	12/20/2025
	Presentation to City (Virtual)	1/6/2026

3 Budget

Barr will bill you on a time and expense basis to be invoiced monthly. The budget presented in Table 2 will not be exceeded without prior authorization by you.

Table 2. Estimated Budget

Description	Labor Hours	Sub-Contractor Total	Project Total
Kickoff and Data Gathering			
Review Existing Data	12.0	$ -	$ 2,150
Kickoff (hybrid) & Site Visit	24.0	$ -	$ 4,800
Survey	11.0	$ 5,500	$ 7,330
	47.0	**$ 5,500**	**$ 14,280**
Alternative Concept Design (10%) - 4 Alternatives			
Hydraulic Modeling	63.0	$ -	$ 9,920
Design and Drawings	84.0	$ -	$ 12,290
Cost Estimates	32.0	$ -	$ 5,320
Memorandum	44.0	$ -	$ 6,920
Project Updates/Monthly Meetings	24.0	$ -	$ 4,965
Stakeholder Meetings (2, virtual)	23.0	$ -	$ 4,470
Presentation to City (1, virtual)	17.0	$ -	$ 3,310
	287.0	**$ -**	**$ 47,195**
30% Design Selected Alternative			
Hydraulic Modeling	31.0	$ -	$ 4,770
Design, Drawings, Renderings	88.0	$ -	$ 12,970
Cost Estimates	19.0	$ -	$ 3,040
Update Memorandum	33.0	$ -	$ 5,055
Project Updates/Monthly Meetings	27.0	$ -	$ 5,430
Public Meeting (1, in-person)	40.0	$ -	$ 7,415
Presentation to City (1, virtual)	17.0	$ -	$ 3,310
	255.0	**$ -**	**$ 41,990**
Project Totals (Fees)	**$ 97,465**	**$ 5,500**	**$ 103,465**
Project Totals (Hours)	**589.0**		

Attachment: Survey Quote from Civil Science

CivilScience
Engineers | Surveyors | Solutions
531 West Villard Street, Suite 1
Dickinson, ND 58601

2/19/2025

Jennifer Koehler, PE
Barr
via email

RE: Surveying Services – Manns Dam Feasibility Survey Scope – Stark County - Dickinson, ND

Civil Science is pleased to provide this proposal in response to your request regarding the above-mentioned project. We are committed to delivering surveying services to the highest quality standards in a timely manner. We staff local engineers and surveyors in Dickinson, ND and have had a positive relationship with Barr on previous project work.

Based on the information you provided in our Teams meeting today and subsequent survey request, we understand this project involves completing a utility survey of approximately 500 ft along the Heart River both upstream and downstream from Manns Dam, and +/- 10 probes between Manns Dam and the Heart River Golf Course pedestrian bridge upstream of the dam to determine existing sediment depths within the channel. we have budgeted a two-man crew during the channel probe fieldwork for safety. We estimate two days of field work and associated time in the office to complete utility locates and to process the data and provide deliverables.

We understand this work will be scheduled sometime after June 1st 2025. We ask for two weeks' notice for scheduling purposes.

Our price for this work will be completed on a time and materials basis not to exceed $5,000.00.

Should you have any questions, please contact me at (701) 219-4511 or at jeasum@civilscience.com.

Sincerely,

Jeremy Easum, PE & PLS
Project Manager

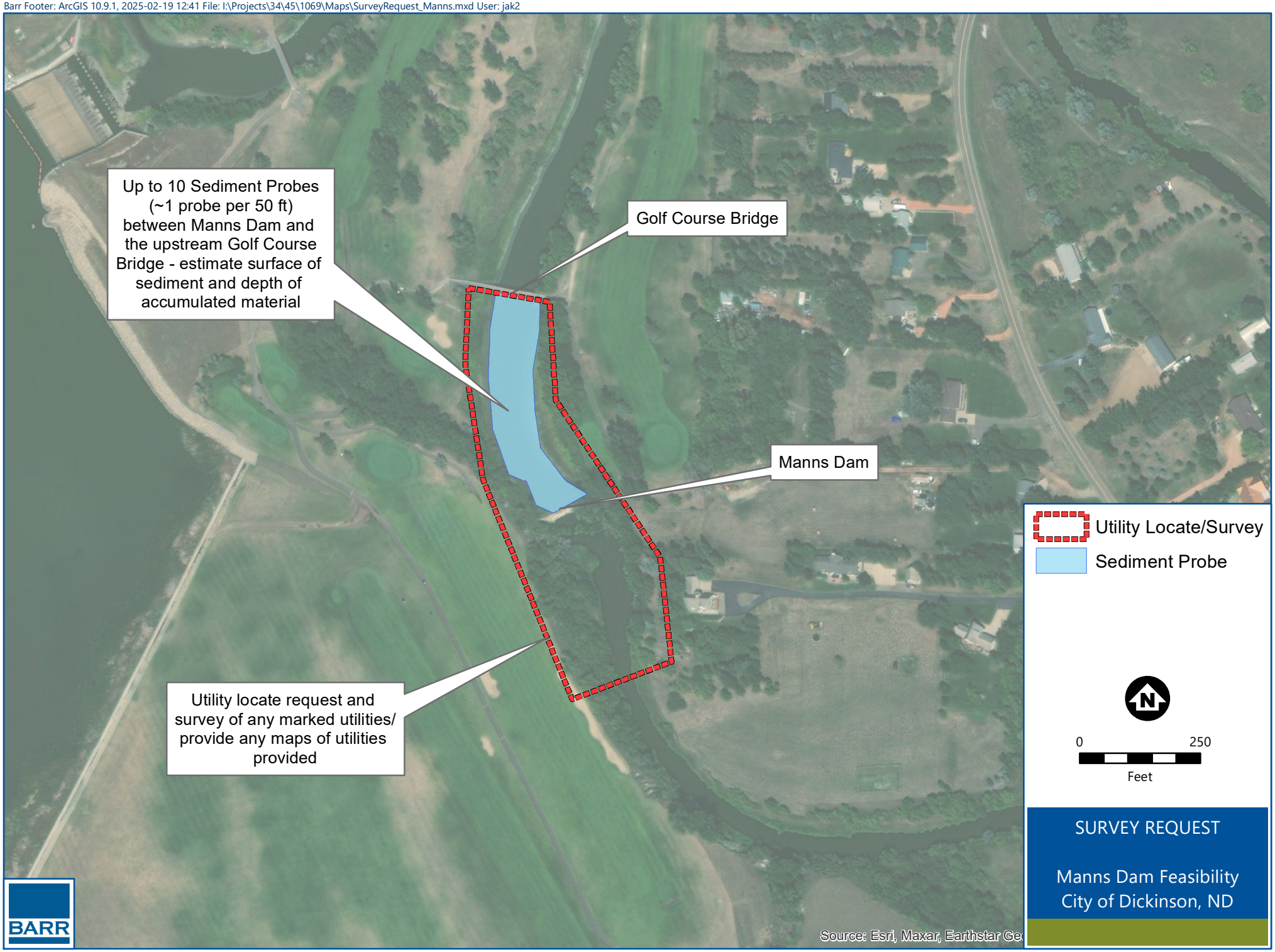
February 19, 2025

Survey Request – For Civil Science

Barr will be completing a feasibility study for alternatives at Manns Dam. We will be leveraging the FEMA 1D modeling for this effort along with the most current LiDAR. However, we will need Civil Science to complete a utility locate request (area in red hatch) for the anticipated project area and survey any marked utilities.

Additionally, because we will be looking at dams in multiple locations (either at existing location or upstream to the first golf course bridge), we want to get a preliminary handle on the amount of accumulated sediment behind Manns Dam upstream to the first golf course bridge crossing. This effort will include collection of approximately one sediment depth probe every 50 feet (up to 10 probes total). This will include capture of the surface of the sediment as well as the depth the probe can be pushed into the sediment until refusal.

All survey data should be in NAD 1983 State Plane North Dakota South, FIPS 3302, feet. Vertical units should be feet, and the datum should be NAVD88. Please provide photos of structures where possible.


Up to 10 Sediment Probes (~1 probe per 50 ft) between Manns Dam and the upstream Golf Course Bridge - estimate surface of sediment and depth of accumulated material
Golf Course Bridge
Manns Dam
Utility locate request and survey of any marked utilities/ provide any maps of utilities provided
Utility Locate/Survey
Sediment Probe
N
0
250
Feet
SURVEY REQUEST
Manns Dam Feasibility
City of Dickinson, ND
BARR
Source: Esri, Maxar, Earthstar Ge