

LOWER YELLOWSTONE PROJECT  
Intake vicinity  
Dawson County  
Montana

HAER MT-141  
*HAER MT-141*

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
INTERMOUNTAIN REGIONAL OFFICE  
National Park Service  
U.S. Department of the Interior  
12795 West Alameda Parkway  
Denver, CO 80228

# HISTORIC AMERICAN ENGINEERING RECORD

## LOWER YELLOWSTONE PROJECT

HAER No. MT-141

Location:

The Lower Yellowstone Project extends in a northeasterly direction from Intake, Dawson County, Montana, through the vicinity of Sidney, Richland County, Montana. It continues in the same direction to the Cartwright vicinity in McKenzie County, North Dakota, then turns northwest, again crossing the Montana border before it reaches the Missouri River at Nohly.

USGS Quadrangles: Intake, MT (1966)  
Savage SW, MT (1966)  
Knife River Mine, MT (1966)  
Savage, MT (1966)  
Crane, MT (1966)  
Piche, MT (1966)  
Sidney, MT (1966)  
Fairview SW, MT (1972)  
Fairview, MT-ND (1997)  
Dore, MT-ND (1968)

Township 18 North, Range 56 East, Sections 36, 25, 24  
Township 18 North, Range 57 East, Sections 3, 4, 9, 6, 17, 19,  
20  
Township 19 North, Range 57 East, Sections 13, 24, 25, 26, 34,  
35  
Township 19 North, Range 58 East, Sections 5, 6, 7, 17, 18  
Township 20 North, Range 58 East, Sections 3, 9, 10, 15, 16,  
21, 28, 29, 32, 33  
Township 21 North, Range 58 East, Sections 2, 3, 10, 15, 21,  
22, 28, 29, 32  
Township 22 North, Range 58 East, Sections 13, 23, 24, 25, 26,  
35  
Township 22 North, Range 59 East, Sections 6, 7, 18  
Township 23 North, Range 59 East, Sections 2, 3, 9, 10, 16, 20,  
21, 29, 31, 32  
Township 24 North, Range 59 East, Sections 24, 25, 26, 35, 36  
Township 24 North, Range 59 East, Sections 24, 25, 26, 35, 36  
Township 24 North, Range 60 East, Sections 5, 8, 18, 19  
Township 25 North, Range 59 East, Sections 12, 24, 25, 36  
Township 151 North, Range 104 West, Sections 6, 7, 19  
Township 152 North, Range 104 West, Sections 29, 30, 31

Dates of Construction: 1905–1910

Engineer: U.S. Reclamation Service

Present Owner: U.S. Department of the Interior, Bureau of Reclamation  
(Reclamation)

Present Use: Irrigation, municipal water supply, recreation

Significance: Twelve historic engineering and historic architectural sites directly related to the Lower Yellowstone Irrigation Project were recommended as a National Register-eligible historic district in 2000. This recommendation found the sites to be significant for their association with the broad pattern of federal reclamation efforts in the early twentieth century, and for the agricultural development of the Lower Yellowstone Valley.

Historian: Jason Marmor, September 2010; Kathleen Corbett, February 2011

Project Information: This documentation was produced in order to mitigate adverse effects to important elements of the historic Lower Yellowstone Irrigation Project, as determined through consultations between Reclamation, the Corps of Engineers, and the State Historic Preservation Officer (SHPO) of Montana in compliance with Section 106 of the National Historic Preservation Act (as amended), and the associated implementing regulations codified in Title 36 of the Code of Federal Regulations, Part 800. A Memorandum of Agreement (MOA) was developed between Reclamation, the Corps of Engineers, the Montana SHPO, and the Lower Yellowstone Irrigation Project Board of Control. This MOA specified that Historic American Engineering Record (HAER) documentation be made as a permanent record of the Lower Yellowstone Project complex as a whole (HAER No. MT-141), as well as for certain significant features subject to impacts from the federal undertaking:

HAER MT-141-A  
Lower Yellowstone Project, Lower Yellowstone Diversion Dam

HAER MT-141-B  
Lower Yellowstone Project, Headworks

HAER MT-141-C  
Lower Yellowstone Project, Cable System

HAER MT-141-D

Lower Yellowstone Project, Gate Tender's Residence

HAER MT-141-E

Lower Yellowstone Project, Garage

HAER MT-141-F

Lower Yellowstone Project, Privy

The documentation was prepared in accordance with the National Parks Service's "Manual for Editing HABS/HAER Documentation" including the "Addendum" to that report, which covers documentation requirements for HAER complexes. Large-format black-and-white photographs were processed and prepared in accordance with guidelines outlined in the National Park Service's "Photographic Specifications for HABS/HAER."

This documentation includes the following: 1) a written narrative placing the project in historical and engineering context, and describing the character-defining attributes; 2) a location map; and 3) a sketch map identifying the features that are being documented at this time.

## NARRATIVE

European-American settlement in eastern Montana began in the late 1870s, and was a product of open range cattle ranching. In the Lower Yellowstone Valley, settlement intensified around 1881, when the Northern Pacific Railway, which connected the Great Lakes region with the Pacific on the Puget Sound, was completed to the area. This too was largely connected to open range cattle ranching. It was not until 1900 that homesteaders interested in the area's potential for dry-land farming began to transform the region into cropland. Irrigation was, to some extent, a component of dry-land farming methods in the arid and semi-arid lands of the American West. Most dry-land farmers practiced flood irrigation or diverted waters from local streams with small ditches to water gardens or to enhance landscaping, but irrigation infrastructure beyond this was generally too expensive for small dry-land farming operations, even when farmers joined together to form irrigation companies.<sup>1</sup>

The Lower Yellowstone Project extends from Intake, Montana, in Dawson County in a northeasterly direction through the vicinity of Sidney, in Richland County, Montana. It continues in the same direction to the Cartwright vicinity in McKenzie County, North Dakota, and turns northwest, again crossing the Montana border before it reaches the Missouri River at Nohly. The Lower Yellowstone Project was one of the earliest federally constructed large-scale irrigation projects intended to enhance agricultural productivity and provide for a more reliable alternative to dry-land farming. Following passage of the Reclamation Act of June 17, 1902, the newly formed Reclamation Service (Reclamation) commenced planning a series of major water control and distribution systems in the western states, including several in Montana. These systems were conceived as a way to promote farming and therefore the large-scale settlement of the western states. Many who advocated large-scale irrigation projects in the West understood them to be solutions to urban problems in the eastern cities. This was articulated by the first director of the newly established Reclamation, Frederick Haynes Newell, who declared in 1900: "The dead and profitless deserts need only the magic touch of water to make arable lands that will afford farms and homes for the surplus people of our overcrowded Eastern cities, and for that endless procession of home-seekers filing through [Ellis Island]."<sup>2</sup> The first of the federally developed reclamation projects approved for construction in the state was the Milk River Project in north-central Montana, the plans for which were approved in July 1902. The Lower Yellowstone Irrigation Project was only the second federal reclamation project in the state, and its early development reveals the government's strong belief in the agricultural potential of the Lower Yellowstone Valley.

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<sup>1</sup> "Historic Setting." Project Details: Lower Yellowstone Project.  
[http://www.usbr.gov/projects/Project.jsp?proj\\_Name=Lower+Yellowstone+Project](http://www.usbr.gov/projects/Project.jsp?proj_Name=Lower+Yellowstone+Project). Accessed May 17, 2010; February 17, 2011.

<sup>2</sup> Quoted in Donald J. Pisani, *Water and American Government: The Reclamation Bureau, National Water Policy, and the West, 1902-1935*. (Berkeley: University of California Press, 2002), p. 2.

### **Planning a New Federal Reclamation Project**

Preliminary planning for the Lower Yellowstone Irrigation Project commenced in the summer of 1903, as engineers investigated conditions in the river valley to determine and recommend which area was best suited to irrigated agriculture. Based on information gleaned from the field study, and upon data about the reliable seasonally high flows of the Yellowstone River, Reclamation engineers conceived the Lower Yellowstone Irrigation Project as a gravity diversion and distribution system, with no impoundment or storage reservoirs necessary. The report of a board of consulting engineers dated April 23, 1904, helped convince federal decision-makers to move forward with the Lower Yellowstone Irrigation Project. The Secretary of the Interior acted almost immediately (on May 10, 1904) to formally authorize the proposed project under the 1902 Reclamation Act.<sup>3</sup> To ensure that work would get underway quickly, the Secretary also allocated \$1.2 million of Reclamation's budget toward creation of the Lower Yellowstone Irrigation Project.<sup>4</sup>

The initial design of the irrigation system featured a large "Main Canal" that would divert water from the Yellowstone River at a point approximately forty miles upstream of Glendive, Montana. The canal was to be located on the west side of the river, and its course would generally parallel the river's northeasterly trajectory for a distance of about 130 miles through Montana and into western North Dakota where the Yellowstone River empties into the Missouri River. However, during the planning phase, the project's diversion point or intake was moved considerably farther (approximately sixty miles) downstream to the present location of Intake, Montana, to avoid difficult terrain and achieve a major cost reduction. With the intake point relocated, the Main Canal would extend for a distance of more than seventy-one miles, to the confluence of the Yellowstone and Missouri rivers.<sup>5</sup> In the spring and summer of 1904, Reclamation completed laying out the route of the canal system, and inventorying lands to be crossed by and/or served by the Main Canal.

In the spring of 1904, Reclamation personnel were able to secure support for the project from a majority of Lower Yellowstone Valley residents, 95 percent of whom agreed to help pay for the cost of the irrigation works and use the system once it was available to irrigate their own lands. Articles of Incorporation were filed in the summer of 1905, and all but two landowners willingly joined the Lower Yellowstone Water Users Association. The Northern Pacific Railway, which owned a large share of lands in the Lower Yellowstone Valley, responded to the opportunity to subdivide and sell off its lands after

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<sup>3</sup> Water and Power Resources Service, *Project Data: Lower Yellowstone Project*. (Washington, D.C.: U.S. Department of the Interior, Water and Power Resources Service, 1983), p. 2.

<sup>4</sup> Cynthia Kordecki et al, *Lower Yellowstone Project, 1996 and 1997 Cultural Resources Inventory, Dawson and Richland Counties, Montana, and McKenzie County, North Dakota* (University of North Dakota Department of Anthropology, Grand Forks, ND, and Renewable Technologies Inc., Butte, MT for the U.S. Bureau of Reclamation, Montana Area Office, Billings, 2000), p. 4.3.

<sup>5</sup> *Ibid.*

their utility and value for agricultural use was virtually guaranteed by the new Reclamation project.<sup>6</sup>

### **Designing the Lower Yellowstone Project**

Design and construction specifications for the Lower Yellowstone Project were developed by Reclamation engineers stationed in Denver, Colorado, in late 1904. The design of the system included an intake structure on the Yellowstone, located about nineteen miles downstream of the town of Glendive, Montana. This water diversion structure would consist of a low timber-crib dam, on the north end of which were concrete headworks that would control the flow of water into the Main Canal. The substantial Main Canal was designed to extend for more than seventy-one miles along the alluvial benchlands west of the Yellowstone River to its confluence with the Missouri River. To distribute the irrigation water, a network of more than 200 miles of gravity laterals would transport water to apply to an estimated 64,000 acres of land suitable for irrigation between the Main Canal and the Yellowstone River. Also included in the project plans was a new small pumping plant at Thomas Point about 19 miles downstream from the canal's headwork. The pumping plant was to be equipped with two hydraulic turbines to lift 45 cubic feet per second of water 31' vertically to supply a canal lateral (Lateral LL) that provides water to irrigate about 2,300 acres of benchland north of Savage, Montana.<sup>7</sup>

### **Construction**

Because of the complexity and large scale of the irrigation project, Reclamation took a phased approach to construction, dividing the overall project into a series of divisions. The Main Canal and lateral system (including the canal headworks) were divided into nine divisions. The dam associated with the headworks and the Thomas Point Pumping Plant was each considered a separate project division or component.<sup>8</sup>

Plans and specifications for the first stretch of the canal (thirty-four miles encompassing Divisions 1 through 4), were approved by the agency in March 1905. Shortly thereafter, Reclamation established two temporary camps for project engineers and support staff. One of these temporary construction camps was located near the headworks, while the other was established about fifteen miles from the intake, and was called "La Mesa" Camp. La Mesa Camp served as the field headquarters for the project, where remaining system design work was completed by imported Reclamation engineers and where progress on project construction was supervised.<sup>9</sup>

Actual construction of the Lower Yellowstone Irrigation Project commenced on July 22, 1905. Contracts for building the first four divisions of the Main Canal were awarded in the summer of 1905, while contracts for constructing the remaining canal divisions and

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<sup>6</sup> Ibid.

<sup>7</sup> See *ibid.*, and Water and Power Resources Service, p. 2.

<sup>8</sup> Kordecki et al., p.4.4.

<sup>9</sup> Ibid.

the diversion dam were not let until early in 1906. The overall project schedule specified that the entire Lower Yellowstone Irrigation Project would be completed in time to carry irrigation water in the spring and summer of 1909.<sup>10</sup>

A labor shortage, high material costs, and harsh weather conditions impacted the progress of construction on the Main Canal, and Reclamation was forced to re-advertise for contractors, who responded with more expensive cost estimates based on known conditions, such as the lack of worker housing in the relatively remote project area. Faced with difficulties procuring contractors, Reclamation realized by 1907 that construction of the entire system would not be complete in time for the 1909 irrigation season. However, rather than delay the long anticipated opening of the Lower Yellowstone Irrigation Project, Reclamation chose to temporarily stop work on the system and allow the portion that had been completed thus far—sixty-two miles of the Main Canal and 127 miles of laterals—to carry water to farmers' lands along the valley in 1909.<sup>11</sup>

The boom in farming settlement in eastern Montana by this time was attributable to many factors, including the railroad's promotion of the area as suitable for dry-land farming.<sup>12</sup> However, farming of any kind brought changes in the landscape that Reclamation was happy to claim for irrigated farming. In the November 1909 issue of *Conservation*, a publication of the American Forestry Association, Reclamation boosters used the Lower Yellowstone Project as a case study in the ability of such projects to promote farm settlement:

The Lower Yellowstone Valley in Montana and North Dakota, where the Reclamation Service has one of its large projects, furnishes a most impressive example of the beneficence of irrigation. The transformation from a vast free range for live stock to a thickly settled community has come quickly. New towns have sprung up, a railroad is building the entire length of the valley, and as far as the eye can reach broad fields of wheat, oats, and corn dot the landscape which a short time ago was marked only here and there by habitation...The opportunity for homeseekers in this valley are unusually attractive, especially for those who are accustomed to the climate of our northern states.<sup>13</sup>

But despite such glowing reports, the project continued to be hampered by problems, most especially with the construction of the timber-crib diversion dam at Intake. The dam structure had been partially completed by the late spring of 1908 when debris-laden floodwaters damaged the pilings and severely scoured the riverbed. Dismissing the contractor, whom they blamed for the damage, Reclamation took over the work of

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<sup>10</sup> See *ibid.*, and Water and Power Resources Service, p. 2.

<sup>11</sup> Kordecki et al., p. 4.4.

<sup>12</sup> *Ibid.*, p 4.5.

<sup>13</sup> "Reclamation Service Notes" in *Conservation: The Official Magazine of the American Forestry Association*. November 1909, p. 714.

completing the timber-crib diversion dam. Despite repeated flooding, by late January 1910 Reclamation was able to complete the structure.<sup>14</sup>

Several years later, around 1913, Reclamation extended the Main Canal an additional five miles to Ferry Coulee, but a shortage of funds delayed plans to complete the canal all the way to the Missouri River or to construct the Thomas Point Pumping Plant.

### **Early Project Organization and Operations**

As with similar federally developed irrigation projects, Reclamation initially divided the operational Lower Yellowstone Irrigation Project into operating districts: three original districts covered different portions of the system, and a fourth operating district was added in 1912 during construction of the canal extension to its temporary terminus at Ferry Coulee. An organizational structure was imposed by Reclamation to ensure that some decision making was appropriately delegated, although the entire project was guided by a Project Engineer (redesignated “Project Manager” in 1914). The Project Manager was responsible for overall operations and maintenance of the irrigation system and was authorized to allocate funds for purchases, execute contracts, oversee and approve payroll, and collect payments from water users. The Reclamation Project Manager was also responsible for producing an annual report, which summarized water deliveries, maintenance and construction activities, and water utilization/crop production in the Lower Yellowstone Valley.<sup>15</sup>

Other personnel who were employed to operate the Lower Yellowstone Irrigation Project included district superintendents, who were responsible for managing water deliveries to landowners and maintaining the Main Canal and laterals. Each district was also provided with a “water master” and a number of canal riders. The water master measured and recorded deliveries of irrigation water to specific landowners. Canal riders inspected the condition of the Main Canal and laterals, and assisted landowners in determining their water needs. Canal riders were usually provided housing built by Reclamation for the purpose. Besides these isolated canal riders’ houses, additional facilities for housing and maintenance were at the construction camps established by Reclamation, including the project field headquarters camp established at La Mesa, as well as satellite offices in each district.<sup>16</sup>

### **Limited Use during the Project’s First Decade**

Despite Reclamation’s optimism, for nearly a decade after the Lower Yellowstone’s canal system began selling and distributing irrigation water to farmers, agricultural development did not rapidly and steadily increase as expected. That dry-land farming was so successful in the region at the time discouraged the belief that irrigation was (or would be) necessary. Add to this that many of the valley’s original settlers had little interest in adapting their established modes of agriculture—primarily livestock grazing—to favor

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<sup>14</sup> Kordecki et al., pp.4.4–4.5.

<sup>15</sup> Ibid., p. 4.5.

<sup>16</sup> Ibid.

irrigated crops. Among those who were willing, federal regulations and fees intended to recoup the building costs of the Lower Yellowstone Project were the subject of much dissent among the water users. Moreover, much of the irrigable farmland in the area had been purchased by land speculators, who had little motivation to sell or develop the land until they could realize a significant profit. As a result, the early years of the Lower Yellowstone Project did not see the widespread utilization, nor did it bring about the changes, that Reclamation had hoped for. This state of affairs, however, would change following World War I.<sup>17</sup>

### **Development and Maturation of the Project After 1919**

Montana's dry-land farming industry, dependent as it was on nature's rain supply, collapsed under the weight of a prolonged drought in the 1910s and early 1920s. Augmenting the disastrous effects of this drought were plunging grain prices following the end of World War I. An epidemic of bankruptcies and farm abandonment, as well as depopulation in the agricultural centers of the state, led to what Kordecki et al. call "one of the most tragic periods in Montana history."<sup>18</sup> Yet the Lower Yellowstone Valley, with its potential to stave off drought-related devastation with irrigation, was less hard hit. With substantial increases in the number of acres irrigated, as well as the amount of water delivered, the builders and managers of the Lower Yellowstone Project felt no small sense of vindication. Crop prices per acre were still low compared to those associated with other projects in the country, due in large part to the short growing season on the northern high plains compared with other parts of the country.<sup>19</sup> Yet farmers who were able to irrigate were not as hard hit as dry-land farmers. A sugar beet industry took hold in the Lower Yellowstone Valley in the early 1920s, and other agricultural pursuits such as dairying were made possible by irrigation.<sup>20</sup>

In early 1920 Reclamation sought to complete the canal as it had been first designed. For all its success, the Lower Yellowstone Project was still not one of the more successful of the projects that Reclamation had undertaken following the 1902 Reclamation Act. Compared to other more successful projects, the rate of farm tenant occupancy, as opposed to owner occupancy, on the farms in the Lower Yellowstone Project and other less prosperous projects was high. Reclamation considered this to be counter to the ideals of the Reclamation Act, noting that tenants were less likely to operate in the long-term best interests of the land than were owner-occupants.<sup>21</sup> To stabilize the Lower Yellowstone Project's financial situation, Reclamation established two formal "irrigation districts" for the project, one that encompassed the project lands in Montana (District 1) and one that encompassed project lands in North Dakota (District 2). These districts sponsored the contracts that oversaw the remaining construction, including the extension of the Main Canal to the Missouri River, the completion of the lateral extensions, and the

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<sup>17</sup> Ibid., pp. 4.6–4.7.

<sup>18</sup> Ibid., p. 4.7.

<sup>19</sup> Pisani, p. 131.

<sup>20</sup> Kordecki et al., pp. 4.6–4.7.

<sup>21</sup> Pisani, p. 131.

construction of the Thomas Point Pumping Plant, which was completed in August 1922.<sup>22</sup>

The early 1930s brought a second wave of dry-land farming failure, as another drought and the Great Depression impacted the area. Once again, irrigated agriculture was able to support viable farm operations, and by 1940 Reclamation recognized a need to expand the Lower Yellowstone Project, although the entry of the United States into World War II delayed this expansion. Two locations were identified for additional irrigated land. The first was about nine hundred acres on either side of the Main Canal at Intake. This unit included a new pumping station and was completed in 1946. The second location was a two thousand three hundred acre unit at Savage, which was not completed until 1950. This second unit required an ancillary lateral system and pumping plant.<sup>23</sup>

In 1960, the Crane Pumping Plant was constructed to lift water to a lateral (BP-1) at Crane Creek. Other subsequent modifications include the construction of the Drain 27 Pumping Plant, which augments the flow of water at Lateral N, located on the east side of the Montana/North Dakota state border.<sup>24</sup>

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<sup>22</sup> Kordecki et al., p. 4.7.

<sup>23</sup> Ibid., p. 4.8.

<sup>24</sup> Water and Power Resources Service, p. 2.

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Water and Power Resources Service

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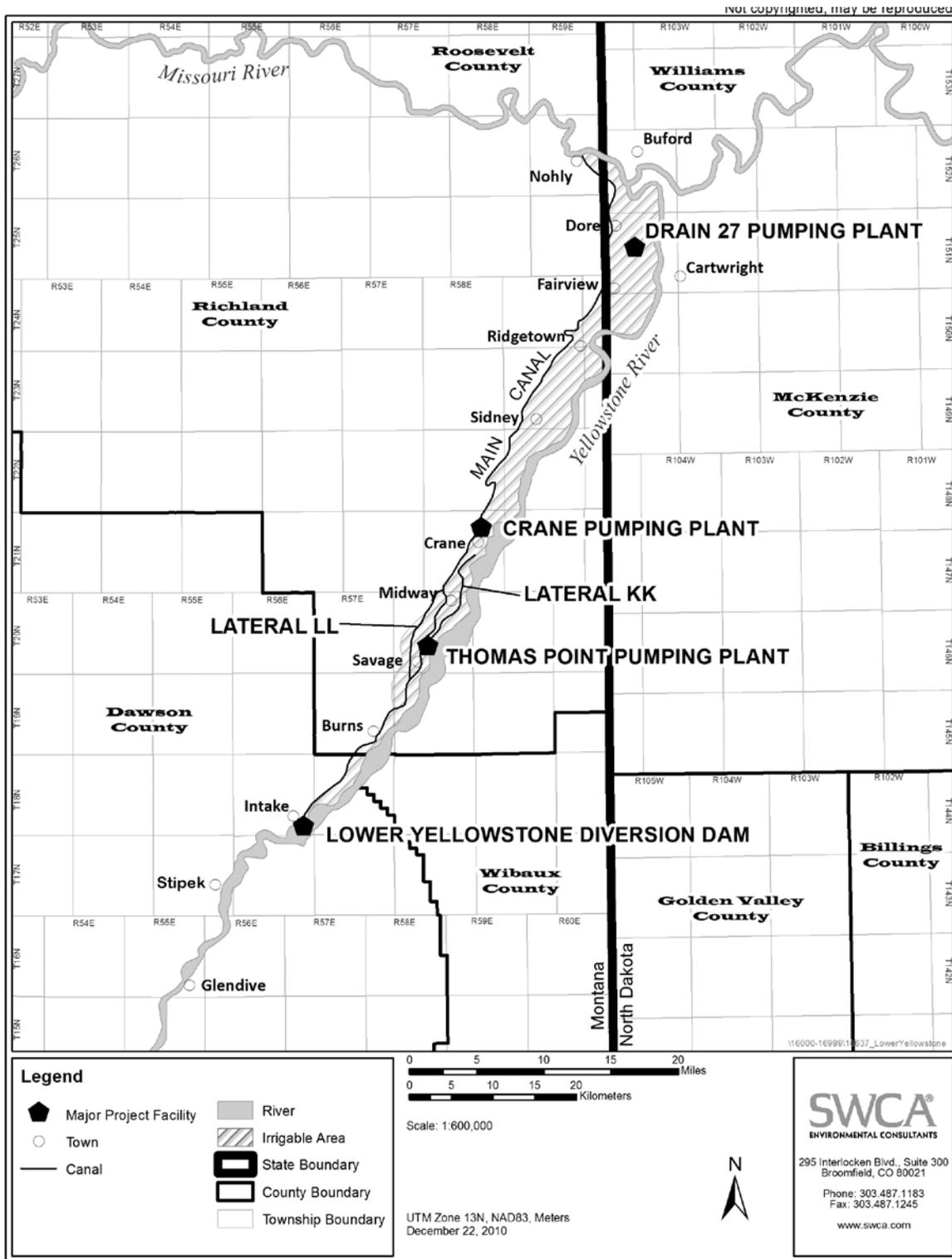


Figure 1: Location map, Lower Yellowstone Project (MT-141)

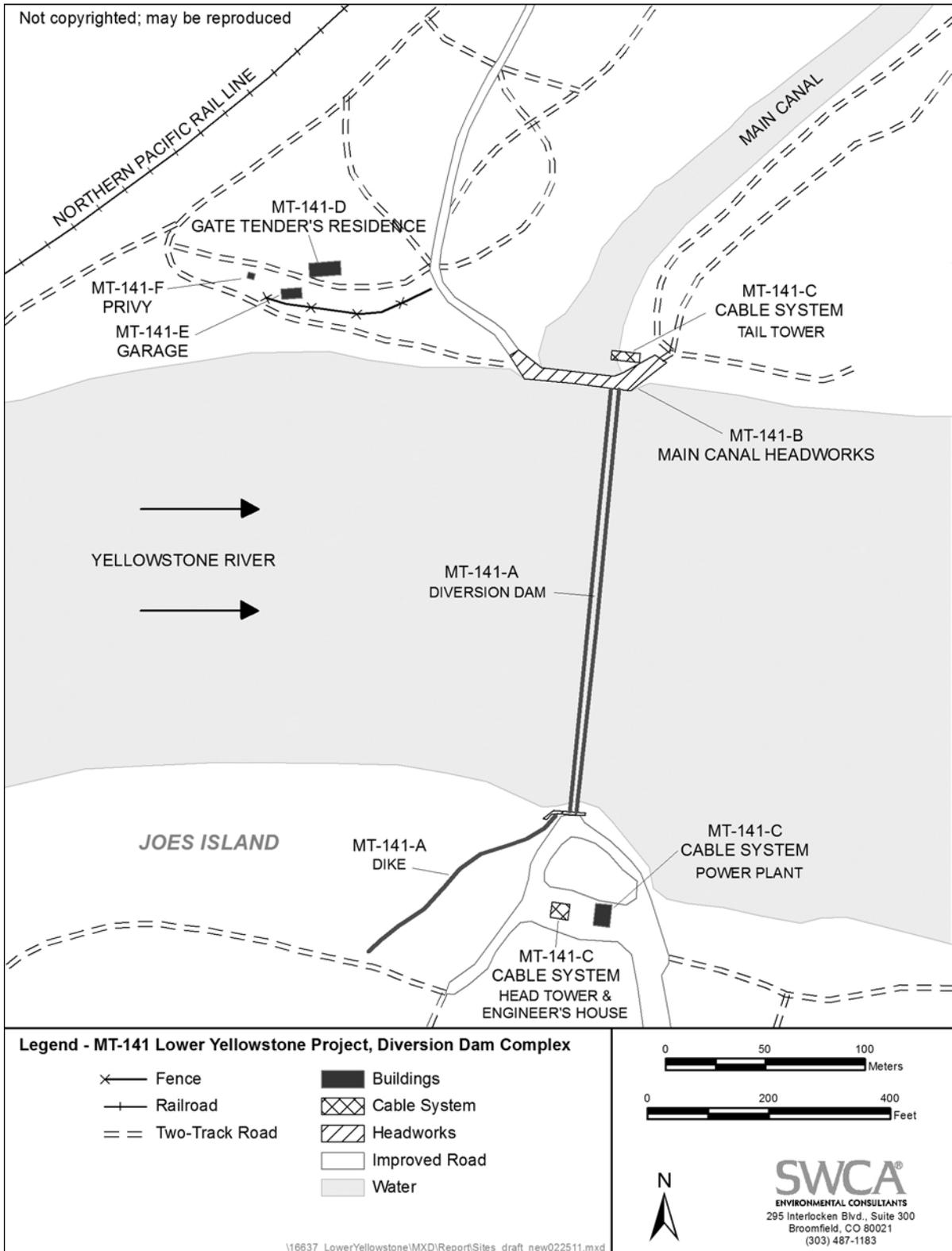


Figure 2: Lower Yellowstone Project, Diversion Dam Complex Sketch Map