

Report No. SES 2009-004  
Deschutes County (+)  
T15S R10E Sections 13, 14, 21, 22, 23, 24

Sisters, OR USGS  
1963 Photo Revised 1981 Series V892  
Henkle Butte, OR  
1962 Photo Revised 1981 Series V892

Project Type: Irrigation Pipeline and  
Hydroelectric Generator  
Project Area: 4.6 Acre  
Acres Surveyed: 4.6 Acre  
New Prehistoric 0 Historic 1 Isolates 0  
Archaeological Permit No. N/A  
Curation: N/A  
Accession Number: N/A

**Three Sisters Irrigation District Main Canal Pipeline and Watson Reservoir Hydroelectric Power  
Project: Phase I Field Survey and Section 106 Evaluation, Deschutes County, Oregon**

Report prepared for the Three Sisters Irrigation District  
and  
The Deschutes River Conservancy

By

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## Introduction

The Three Sisters Irrigation District (TSID) is proposing to replace their Main Canal from the headworks (Figure 1) with two 54-inch high density polyethylene pipelines (HPDP) approximately 4 mile in length. The project will begin at the canal's headworks on Whychus Creek to Watson Reservoir. Two 750-kilowatt turbines will be installed at the terminus below the Watson Reservoir.

The primary objective of the project is for water conservation and green power generation. Historically, Whychus Creek has been completely dewatered during low flows during the summer irrigation season. Typical creek flows are 80 to 150 cubic feet per second (cfs) with losses of approximately 9 to 12 cfs. Improved control of water in the conveyance and delivery system will eliminate existing canal seepage and evaporation. The TSID proposes to transfer 6 cfs of the conserved water for augmenting the in-stream flows of Whychus Creek.



Figure 1. Three Sisters Irrigation District Headworks

The majority of the project impacts will occur within the existing canal ditch and their 50-foot wide easement on both sides of the canal. The pipeline construction will be confined to the existing canal ditch. The cultural resource survey and documentation is for ensuring that prehistoric or historic properties eligible to or included in the National Register of Historic Places (NRHP) are evaluated in accordance with Section 106 of the National Historic Preservation Act of 1966 as amended. A level of effect for the project on prehistoric and historic properties is also included in the summary and conclusions.

## Use of the Term “Squaw”

The Squaw Creek Irrigation District changed their name to the Three Sister Irrigation in response to 2003 legislation. The State Legislative Assembly enacted legislation in 2001 (ORS 271.600) at the request of the Oregon federally recognized tribes to eliminate the use of the term “squaw” for a public property or public body. This legislation had a sunset date of 2005 that was repealed in 2005 and left the legislation in place in perpetuity.

## Environmental Setting

The TSID Main Canal Pipeline and Watson Reservoir Hydroelectric Power Project is located in T15S R10E Sections 13, 14, 21, 22, 23 and 24 (Figures 2). The project lies at the edge of the High Lava Plains and the eastern slope of the Cascade Range in the Deschutes Basin. The area is a relatively undeformed expanse of young lava flows overlain with mixed Mazama pumice soils and interrupted by an occasional cinder cone (Baldwin 1976).

The vegetation is characteristic of the *Pinus ponderosa* Zone (Franklin and Dyrness 1978). The zone has a short growing season and minimal summer precipitation. Diurnal summer temperatures fluctuate widely with hot days and cold nights. Average annual precipitation is 13.5 inches with precipitation during the months of July, August and September being 1.4 inches. Much of the summer rain is ineffective because it usually comes during brief and intense thunderstorms. The remainder of precipitation is resultant of winter snows.

The overstory is primarily Ponderosa pine (*Pinus ponderosa*), with an occasional lodgepole pine (*Pinus contorta*), and aspen (*Populus tremuloides*) occurring in riparian environments. The understory includes antelope bitterbrush (*Purshia tridentata*), rabbitbrush (*Chrysothamnus* sp.) and Idaho fescue (*Festuca idahoensis*). Riparian bank vegetation for Whychus Creek and the main canal includes various grasses, willow (*Salix* sp.), red osier dogwood (*Cornus sericea*), wild rose (*Rosa* sp.), hardhack spirea (*Spiraea douglasii*), and scouringrush horsetail (*Equisetum hymale*).

Elevation ranges from 3175 to 3370 feet above mean sea level.

## Ethnographic Background

The project area lies within the historic territory of the Molala (Zenk and Rigsby 1998:440) and *Wada hichi-dike* or Juniper-Deer Eaters Band of the Northern Paiute (Stewart 1939, 1941). Large game constituted the single most important food resource exploited by the Molala (Zenk and Rigsby 1998). Deer and elk were economically important as meat and hides. Other animals such as coyotes, bobcats, and eagles were harvested for fur and feather. Seasonally restricted resources including salmon and steelhead; camas and other roots, and huckleberries were also harvested throughout their historic range. Similarly, the Northern Paiute inhabiting the area (Fowler and Liljeblad 1985) took both large and small game including deer, antelope and desert bighorn sheep, hares and rabbits, marmots, and porcupines. Secondary food resources included a wide variety of fish, seeds and other plant resources.

Molala settlements were comprised of single or more extended-family households at a sheltered lower-elevation site during the winter months and transitory camps during the drier part of the year. Basic house type was rectangular, constructed of bark, planks, or both laid on a gabled structural framework. House floors were excavated to a depth of two or three feet. Mats and hides covered the walls and floor. Unexcavated summer shelters of bark or thatched-rush structures covered by mats or boughs resembled their winter shelters.

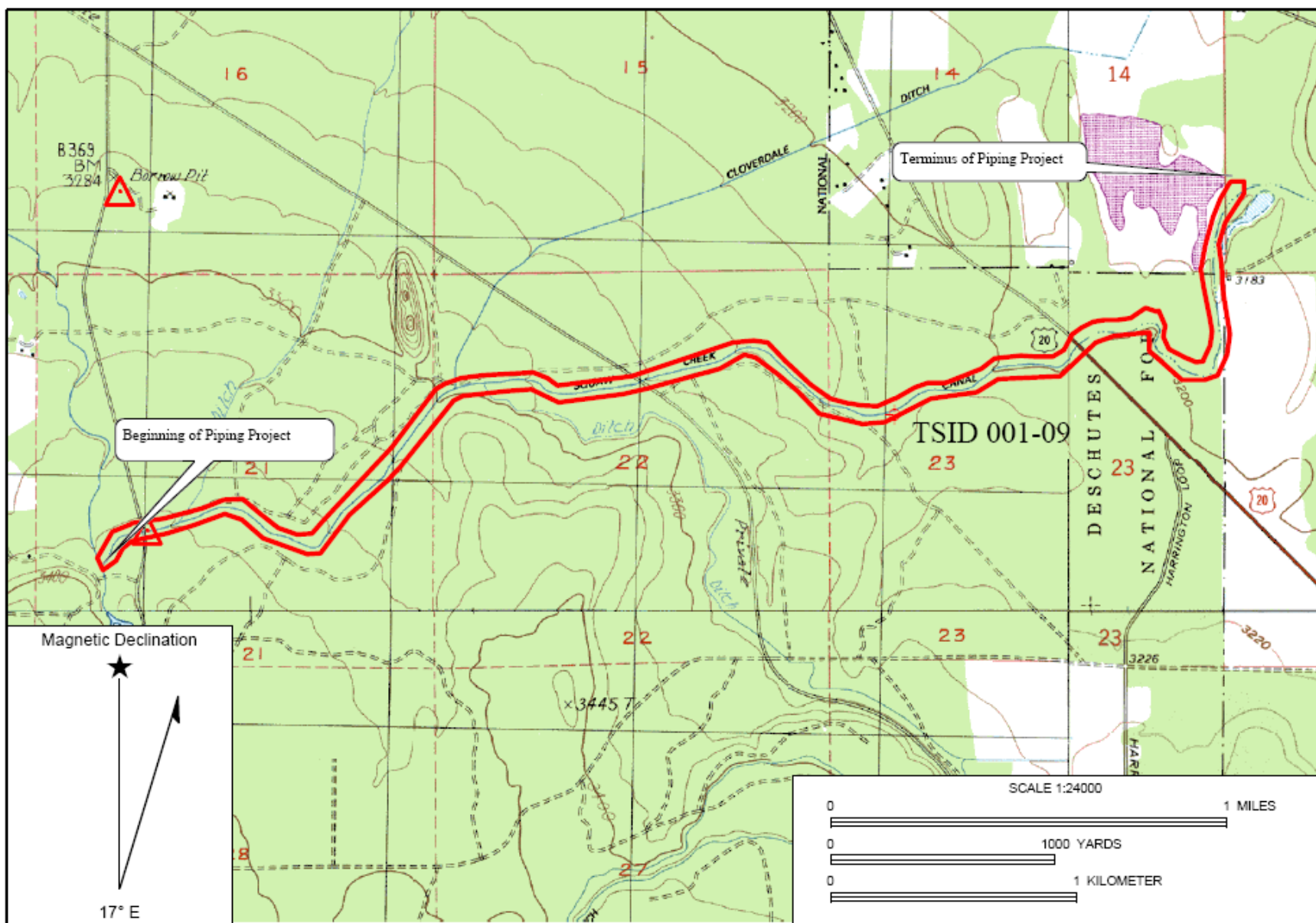


Figure 2. T15S R10E Sections 13, 14, 21, 22, 23 and 24 – Sisters and Henkle Butte, OR 7.5 minute USGS Base Map

Northern Paiutes settlements were comprised two to three related families camped in dispersed locations so as not to overexploit fuel and other resources. House types and construction details varied through the region and usually based on availability of suitable resources for construction and season.

### **Prefield Literature Search**

The Oregon SHPO GIS database and documentation and were reviewed prior to conducting the field survey. Don Zettel, Sisters Rangers District Archaeologist, was also consulted with to obtain data housed in their district files. A couple of Forest Service projects have been conducted within proximity of the project area (Swift and De Klyen 1990, Zettel 2006). Resources identified include four refuse scatters and one prehistoric lithic scatter. These resources are not within the proposed project area.

### *Euro-American Settlement in the Deschutes Region*

The earliest Euro-American foray into the upper Deschutes region was by John C. Fremont in the November 1843 (Brogan 1977). During Fremont's expedition, he noted that as they traveled south past Benham Falls to Klamath Marsh that they found Indians in established villages but no specific location was identified. Nathaniel J. Wyeth encountered both Northern Paiute and Tenino people during his journey through the Deschutes Basin (Wyeth 1969).

By the 1860s, the tribes of the region had ceded their usual and accustomed lands that they had used since time immemorial to the United States government in return for reservations, to which they were later relocated.

### *Irrigation Development in Central Oregon*

Euro-American emigrants began settling the Upper Deschutes Basin when land grants became more difficult to acquire west of the Cascades under the Homestead Act of 1862. The Federal land grants acts encourage settlement in the late 1800s and early 1900s. The High Lava Plains lies in the rain shadow of the Cascades limiting the annual average precipitation to about 13 inches per year. It was realized that irrigation was needed in order to successfully farm the region.

Small-scale irrigation projects were generally created through cooperative efforts involving local settlers and homesteaders who live adjacent or near a perennial reliable water sources. Little or no capital investment and minimal engineering technology characterize these cooperative projects. The other type of irrigation projects developed in Central Oregon were large scale projects and developed with large sums of capital investment.

The passage of the Carey Act in 1894 by the United State Congress further encouraged settlement of the western United States. This Act ceded millions of acres of land in ten states for the purpose of settlement if the landowner would settle, irrigate and cultivate their land patent. Settlers received 160 acres of land if they lived on it and within ten years converted at least twenty acres to irrigated agriculture.

The state of Oregon adopted the provisions of the Carey Act in 1901. This enabled legislation to create the State Land Board that administered reclamation and settlement of the arid lands east of the Cascades without the State assuming any cost liability. The State also allotted and controlled water and water rights.

### *Squaw Creek Irrigation Company*

Within a couple decades, The Squaw Creek Irrigation Company (SCIC) evolved as a cooperative venture between neighboring farms to an irrigation district. Farmers started utilizing the water from Squaw Creek

(now Wychus Creek) as early as 1869 or 1871 (Brogan 1964). Michael Hall provides a general overview (1994) of two cooperative ventures, the SCIC and the Deschutes Reclamation and Irrigation Company or the Swalley, developed in Central Oregon at the turn of the 19<sup>th</sup> Century. Hall also provides a description of the SCIC from its earliest construction to 1920 when the second headworks was destroyed by a flood event. Early water rights for the SCIC were filed in 1884, 1885, 1889 and 1892. Sam Davis built the first ditch in 1889. Oscar Maxwell built a ditch utilizing the creek flows in 1892. Individual settlers and homesteaders built additional small ditches.

Following the passage of the Carey Act the SCIC was formed in 1895 with the water rights that had been applied for in 1892. The SCIC contracted for the reclamation of 11,766.84 acres (Vaughn 1981) and by 1910, the company claimed rights to 11, 042 acres (Deschutes County Historical Society 1985).

The main canal was enlarged in 1912 and 1913 to extend the system to the upper end of Lower Bridge. All the work was done by hand and horse-drawn equipment. Progress continued on the system and the SCIC became the Squaw Creek Irrigation District (SCID) in 1917. It was the second district to formally file and be recognized by the State. The headworks was reconstructed in 1915 or 1916 consisted of a concrete dam and concrete head works about a mile downstream. A new point of diversion was selected in 1919 and a new dam and headgate were built of concrete. The concrete diversion dam was improperly constructed and washed out and destroyed almost immediately during a flood event in 1920.

A log crib dam was built to replace the destroyed concrete structure. R.H. Bayley built this structure about forty feet below the original dam. The log crib dam was constructed by excavating the ground to hardpan including the removal of approximately six feet of gravel being removed. Logs were then “cribbed” in the bed of the stream with the cribs extending about twenty feet into the bank of both sides of the stream. This crib was carried about eight feet above the original bend of the stream. Twelve by twelve timbers were then laid against the upstream side of the crib at a forty-five degree angle with the lower end embedded in the hardpan. A mat of fir brush was laid to a depth of about one foot from fifteen feet upstream and on the timbers angled at forty-five degrees. The brush was then loaded with earth and gravel. The shore cribs were planked on the side toward the stream.

The spillway was about twenty-five feet long including a waste gate and extended the full width of the creek channel. The spillway portion of the dam was covered on top with four by twelve planks and similar planks place at an angle of forty-five degrees covering the downstream face of the dam. Water running over the spillway fell on a floor of similar planks extending twelve feet down-stream.

A waste gate of five feet wide was cut in the west end of the dam with its bottom some four feet below the crest of the spillway. The gate operated against twelve by twelve timbers set vertically and dovetailed into the logs of the dam. Each timber was strongly braced on both the upstream and downstream side. The bottom of the gate was floored and the sides were planked. A gate made of plank and designed to work vertically in grooves made by leaving a space between the ends of planks in the sidewalls of the gate.

Logs were laid parallel to the bank from the dam up to the concrete gate on the west bank of the stream provided or the individual user. These logs were planked over to a level about four feet above the top of the spillway. The crib extended upstream about forty feet on the east bank of the stream and ran back of the concrete headgate to the district’s canal. The crib was filled with earth and not planked over.

The main canal ditch was rip-rapped with rock for about fifty feet below the headgate. The ditch was built through good soil and was not subject excessive losses. The ditch was about twenty feet wide on the bottom and carried approximately four feet of water safely. It was designed to carry about 150 cubic feet per second (cfs) and has a recorded discharge of 155 cfs. The headworks are located in T15S, R10E,



Section 21 NW/SW. The ditch runs generally in an easterly direction for about a mile joining an older portion of the ditch near the west line of Section 22.

About 500 feet below the intake there is a waste gate in the lower bank of the ditch. The gate is set well below the grade of the ditch. It is about sixteen feet wide and built of concrete. A concrete wall extends about six feet into the lower bank of the ditch on the upstream side and another extends about three feet along the bank of the ditch on the downstream side. Concrete walls also extended about six feet down the banks of the waste ditch. The gate was closed by flashboards. Water is wasted down a draw to Squaw Creek.

Immediately below the waste gate there was a wheel installed by the State Fish Commission designed to turn with the current in the ditch and scare the fish from going down it. The wheel was considered to obstruct a portion of the ditch flow. An automatic discharge gate was located just below the wheel and probably installed by the Geological Survey.

The Cloverdale Irrigation District, which formed in 1903, had water rights to Squaw Creek and later merged with the SCID in 1935. A re-regulating facility, The McKenzie Canyon Dam and Reservoir was built in 1957-1958 to assist in serving the Lower Bridge area. The Watson Reservoir was built in 1964 in the southwestern portion of the Cloverdale area to eliminate irrigation flow variations due to creek flow variations. A new concrete dam was built in 1970 about 200 feet above the log crib dam (Deschutes County/City of Bend 1986).

W.B. Burt, Special Agent of the Government Land Office in The Dalles, provided a concise description of the historic Squaw Creek Canal in 1924. The following is the descriptive narrative by Special Agent Burt:

“New head works were constructed after the removal of the concrete diversion dam. The head gate structure was about fifty (50) feet long. A wing wall extension into the bank at the south end, but was buried so its length could not be ascertained. There is a wing wall 15 feet long along the bank of Squaw Creek at the north end of the gate. The walls were approximately 12 inches thick.

“The gate had five apertures, each four feet square and spaced five feet from center to center. The piers between the apertures are of concrete and extend ten feet down the ditch. They were 12 inches thick. The piers between the apertures are of concrete and extend ten feet down the ditch. They are 12 inches thick and the wall of the gate itself is two feet thick. Upstream from the gate a rock crib was built for about 30 feet along the bank of the creek and above that there is about one hundred feet of earth fill. On the down stream end of the gate is a crib, which extends downstream to the present diversion dam.

“The condition of this head gate was poor. The concrete was disintegrating and the piers have been covered with boards to protect them from the action of water. The wall of the gate was cracked and clear through in one place. This condition is attributed to settling that indicates improper foundations.

“About a quarter of a mile below the intake a small ditch crosses the Squaw Creek Ditch. This is the Reed Ditch, which had a crude but effective intake a short distance above the main ditch intake. It is used for irrigation. The crossing of the main ditch was accomplished merely by discharging water into it from the south and taking it out again on the north. There are no structures in the south bank. The outlet was controlled by feather boards, but has no measuring device. Because there was no measuring device, it was possible that dissensions over water could

have occurred in years of shortage. There is a timber check in the main ditch just below the Reed ditch, apparently to facilitate the turning out of water.

“About a quarter mile further downstream of the main ditch, it crossed an abandoned ditch, once known as the Wilson Ditch. Within a few hundred feet below that point, the Cloverdale ditch crosses the main ditch in the same manner as the Reed Ditch.

“Gates built of plank and operated by threaded stems closed the apertures in the headgate.

“A few enlargements had been made between 1915 and 1924, particularly to the laterals of the Lower Bridge Water Users’ Association and the Black Butte Land and Livestock Company.”

The existing head works was built in 1970. Four laterals or turnouts exist along the main canal. These include the Uncle John Turnout, Cloverdale Turnout, Fryrear Turnout and the Patterson Turnout. An inflow weir is located at the southeast end of an earthen dam that creates Watson Reservoir.

### **Phase I Field Survey**

The main canal is literally a ditch dug to the underlying basalt and follows the natural contours of the landscape. An intensive surface survey of the project area was conducted on April 2, 3, and 10, 2009. The APE, which included the 50 foot easement on both sides of the main canal was surveyed utilizing 5 meter transects that ran perpendicular to the canal. The canal and its bed and bank were also examined. Surface visibility was generally poor to good. Both natural vegetation and a pine needle duff layer inhibited visibility.

One historic refuse scatter of 10 vent hole evaporated milk cans and a crimped seal sanitary can (a 303 can) post-dating 1963 was identified during the pedestrian survey (Figure 3 and 4). This resource given the lack of additional physical evidence and the age, the resource does not meet the criteria for eligibility to the NRHP.



Figure 3. Representative Sample of Cans from TSID 001-09.



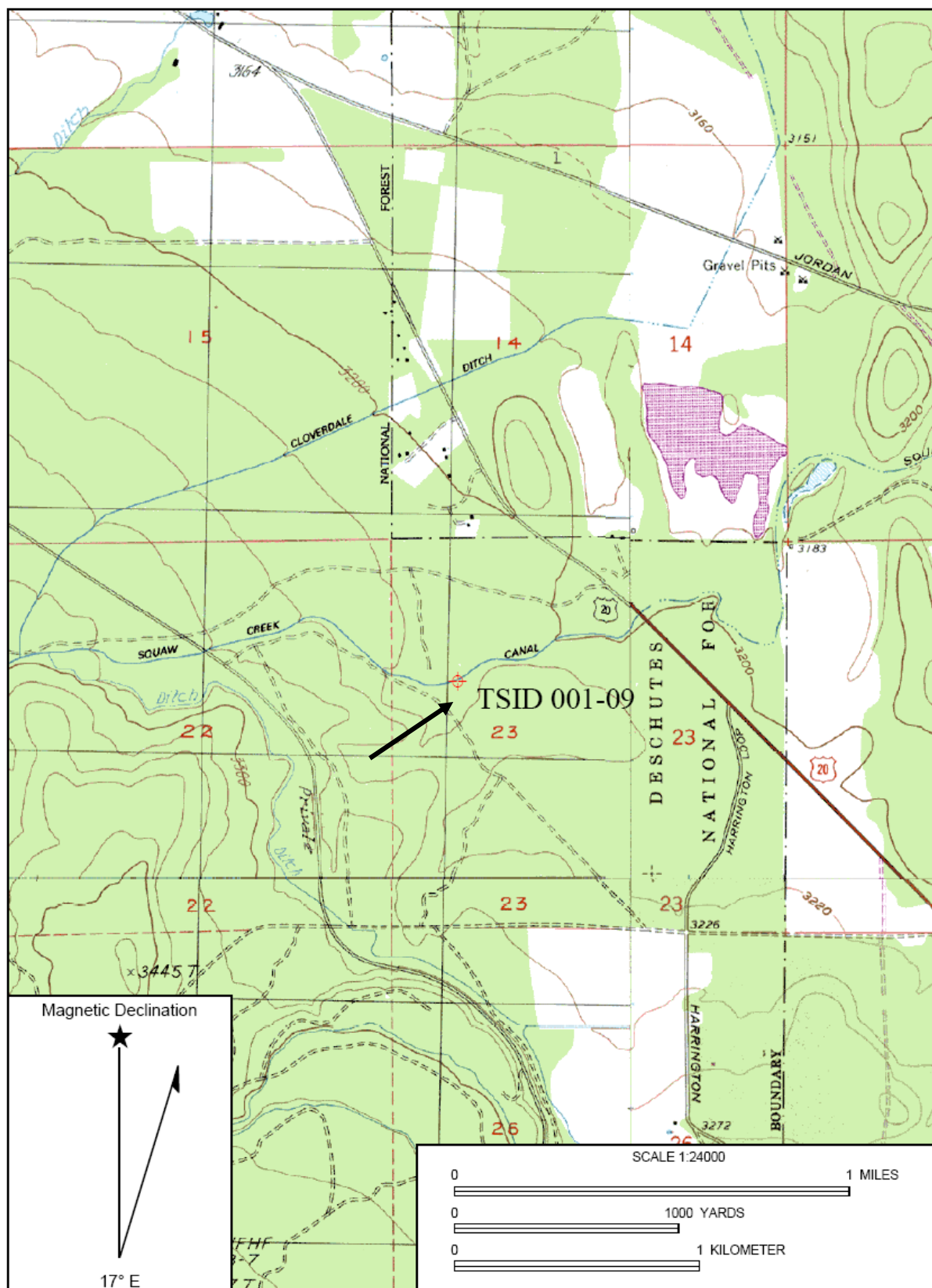


Figure 4. Isolate Find TSID 001-09 T15S R10E Section 23 NE/SW/NW

## **Conclusions**

The purpose of this survey is to determine the impact of ground disturbing activities on properties eligible to or included in the NRHP. The Oregon SHPO (Curran, personal communication) considers all the existing irrigation systems in Central Oregon eligible to the NRHP. Therefore, the Squaw Creek Canal is relatively intact as described in 1924 with the exception of 1970 head works and the inflow weir for the Watson Reservoir and eligible to the NRHP. The pedestrian survey failed to identify any new or previously inventoried cultural resources that are eligible to or included on the NRHP within the APE.

The Three Sisters Irrigation District Main Canal Pipeline and Watson Reservoir Hydroelectric Power Project as planned will have an adverse effect on a NRHP eligible property. It will be necessary to consult with the Oregon SHPO to determine the need for any mitigation that may be needed as a result of the piping and hydroelectric project. This recommendation is made to ensure that the project comply with the NRHP. It is also important to note that buried cultural materials may be encountered during the implementation of ground disturbing activities. In the event of an inadvertent discovery, all work shall cease and evaluated by a professional archaeologist.

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## Appendix A

### Site Form

TSID 001-09