EXPANDED CHECKLIST ENVIRONMENTAL ASSESSMENT

COMPANY NAME: **Tintina Resources Inc.** **Project:** **Black Butte Copper Aquifer Test 2014**
PERMIT OR LICENSE: **00710** **County:** **Meagher**
LOCATION: **Sections 24, and 25, Township 12 North, Range 6 East**
PROPERTY OWNERSHIP: **[ ] Federal [ ] State [X] Private**

TYPE AND PURPOSE OF ACTION: Tintina Resources Inc. (Tintina) is requesting to modify its exploration license to authorize conducting aquifer tests on three new wells to better define water resource data including additional groundwater quality, water level, and aquifer properties for different hydrostratigraphic units in the area of the Black Butte Copper Project. The Black Butte Copper Project Area is located about 15 miles north of White Sulphur Springs in Meagher County, Montana. The site is accessed from White Sulphur Springs via U.S, Highway 89 and then by a two-mile long, gravel county road that with winter snow plowing is passable year–round. See Figure 1.

Exploration activities at the Black Butte Copper Project have been previously approved under Exploration License #00710. DEQ holds a bond for the currently approved disturbances and would recalculate the bond amount if the modification is approved.

The proposed aquifer tests would provide a more quantitative understanding of the interaction between stratigraphically controlled (layered) groundwater aquifers and surface water within the project area, and allow evaluation of the bulk permeability of shallow hydrostratigraphic units. These data would then be used to predict impacts of the potential future mining of the copper deposit on surface water and groundwater quantity and quality.

The proposed action includes conducting aquifer tests on three new pumping wells (PW-8, PW-9, and PW-10) as well as water quality/water level monitoring of the three test wells and a new monitoring well (MW-9) in conjunction with ongoing monitoring of existing wells. Long-term aquifer tests (up to 30 day duration) would be conducted on PW-8 above the mineralized zone and PW-9 in the mineralized zone. It is estimated that PW-8 would be pumped at 30 gallons per minute, and that up to 30 days would be required after this aquifer test for water levels to recover before the testing of PW-9 (to be pumped at an estimated 5 gallons per minute) begins. Water levels would again be allowed to recover before the final aquifer test is conducted on PW-10. A 24-hour aquifer test would be conducted on PW-10 below the mineralized zone at 30 gpm. Up to 15 other wells and piezometers in the project area, as well as surface water and spring monitoring sites, would be monitored during the aquifer tests.

Water discharged from the test wells would be diverted to a lined holding pond capable of storing a volume equal to 110% of the maximum volume pumped during a 24 hour period. Water from the pond would be disposed of through a LAD system covering 40 acres at rates that would not exceed agronomic uptake (evapotranspiration) rates, resulting in zero discharge to groundwater or surface water. Water application throughout the LAD area would be maintained at or less than 90% of the normal year net irrigation requirement (see Table 1). Irrigation would occur for a maximum of 6 hours per day, with a minimum 18 hour drying period prior to the next application cycle. In the event that prolonged rainfall during the pumping tests precludes discharge to the LAD area at agronomic rates for a period longer than the water can be contained in the holding pond, Tintina would either temporarily store excess water in tanks or interrupt the pumping test. A lined contingency pond would be constructed if needed to store water if the test period extends into colder months of the year. The pond would be designed to hold the anticipated volume of water from testing PW-9 and PW-10 plus an additional foot of freeboard. See Figures 2, 3, and 4.

The aquifer tests would be conducted during the 2014 growing season. If the tests are not completed during the

growing season then Tintina would proceed with construction of a contingency storage pond that can contain all of the water to be produced from the aquifer pumping test. This water would be disposed of later on in the same manner as proposed during warmer months.

Reclamation Plan: The reclamation plan includes reseeding as necessary and follow up weed control monitoring and treatment if required, as well as removal of the storage pond(s) and plugging of the wells. During construction of any of the facilities (ponds, drill pads, etc.) needed for this proposal, all topsoil will be stockpiled for later use in reclaiming those sites. All disturbances will be recontoured to a stable and suitable landform, covered with the salvaged topsoil and revegetated using a Department-recommended seed mix suitable for the post-mined land use of grazing and wildlife habitat. All equipment used for the LAD system (main line, trunk lines, and fixtures) will be removed after all water from the aquifer tests has been discharged to the LAD system. Sections of the discharge lines that can be reused will be stored at the laydown yard and damaged or worn lines will be sent to a landfill. Drill holes no longer needed for assessing the hydrologic conditions at the site will be abandoned per ARM 17.24.106. Tintina will continue to use their industry standard BMPs and their approved practice of reseeding and weed control.

N = Not present or No Impact will occur.
Y = Impacts may occur (explain under Potential Impacts).

IMPACTS ON THE PHYSICAL ENVIRONMENT	
RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are soils present which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?	**[Y] Potential Geology and Soil Impacts** There would be no potential geology impacts associated with the proposed action. The potential impact to soils would include the disturbance of up to ½ acre of land for the construction of water storage ponds and the accumulation of salts and metals contained within groundwater discharged to the LAD area during the aquifer tests. Maximum loading rates would be substantially lower than EPA guidance for land application. The sections below provide summaries of current information on geology and soil conditions in the Black Butte Copper area. The copper-cobalt-silver (Cu-Co-Ag) deposits of Black Butte occur in middle Proterozoic sediments of the Belt Supergroup (Zieg and Leitch, 1993). During this period, a deep water basin, the Helena Embayment, was formed. Calcareous shale (Newland Formation) was deposited in the eastern part of this basin. The northern boundary of the Helena Embayment is located along the southern flank of the Little Belt Mountains north of White Sulphur Springs, Montana. The Newland Shale hosts the Black Butte Copper massive sulfide deposits, and consists of a lower shale-dominated section, which measures approximately 2,500 feet in thickness and an upper carbonate-dominated section which measures approximately 1,150 feet thick. Within the project area, the lower Newland Formation (YNL) is

	divided into an upper unit (referred to as the YNL-A) and a lower unit (the YNL-B) which contain relatively minor amounts of sulfide minerals and have been shown from geochemical kinetic testing to be strongly net neutralizing. Between these units is a region of the YNL known as the Upper Sulfide Zone (USZ). Within the USZ is a copper-enriched zone referred to as the Upper Copper Zone (UCZ), otherwise known as the Upper Johnny Lee deposit. Mining of this deposit may be proposed in the future, and the currently proposed aquifer tests will provide information on how these and surrounding geologic units are interconnected hydrologically. <u>Soils:</u> The NRCS Soil Survey shows three soil units in the LAD area which are as follows: • 38D-Woodhall-Woodhurst, very stony Bavdark complex; • 465E-Libeg, boulder-Bangtail-Redchief, very stony complex; • 1142D-Duckcreek-Redchief, very stony Ratio peak, boulder families, complex Based on the NRCS web soil survey, these soil units typically consist of varying thicknesses of clay loam, loam and gravelly loam with the depth of bedrock ranging from 24 to 36 inches below the surface. All constituents in previous water samples from pumping wells completed in similar geologic units (i.e. wells PW-3 and PW-4) are below the EPA's Recommended Limits for Constituents in Reclaimed Waters for Irrigation (U.S. EPA, 2006). In addition to water quality limits, the EPA has recommended annual loading limits for metals, which are based on World Health Organization recommended annual limits for metals applied to agricultural land (Chang et al., 1995). Arsenic is the only metal with a recommended loading limit (1.78 lbs/acre) that is present above the detection limit in samples collected from wells PW-3 and PW-4. The arsenic load was calculated for the anticipated arsenic concentration and flow rate from each test well. All of the calculated loads are well below EPA's recommended load criteria for arsenic of 1.78 lbs/acre with estimated arsenic loads from individual tests that are one to four orders of magnitude below EPA's criterion. Assuming maximum loading values for each of the three proposed tests yields a total estimated load of 0.0972 lbs/acre, which would be more than an order of magnitude below the EPA criterion. Therefore, arsenic loading to soils from the proposed testing would be below the level of significance.
2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for	**[N] POTENTIAL SURFACE WATER IMPACTS** There would be no potential impacts to surface water quality or quantity associated with the proposed action. The water from the aquifer test would be disposed of at an LAD site at agronomic rates, precluding impacts to surface water or groundwater. A contingency

IMPACTS ON THE PHYSICAL ENVIRONMENT	
violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?	water storage pond would be constructed near the LAD site if the aquifer testing extends into the colder months of the year. The sections below describe surface water features in the Black Butte project area. Baseline surface water monitoring has been conducted in the project area since 2011 and is ongoing. These data have been compiled in quarterly baseline monitoring reports. The project area is within the Sheep Creek watershed, a tributary to the Smith River, which is in turn a tributary of the Missouri River. Sheep Creek is a fifth order stream draining a total of approximately 194 square miles. The project area is located in the approximate upper third of the drainage. Sheep Creek originates in the Little Belt Mountains at an elevation of about 7,600 feet and discharges to the Smith River approximately 23 river miles to the west of Black Butte at an elevation of 4,380 feet. The Project area is approximately 17 air miles above the confluence with the Smith River which is a popular destination for recreational fishermen, rafters, and boaters. Sheep Creek is a high quality stream that flows in a meandering channel through a broad alluvial valley upstream of the project site but enters a constricted bedrock canyon just downstream of the project area. Water from Sheep Creek is used principally for stock water, irrigation, and fishing. The primary tributaries to Sheep Creek in the immediate project area are Coon Creek and Butte Creek. Coon Creek drains the area east of Black Butte and joins Sheep Creek before Sheep Creek flows into the canyon located approximately one mile northwest of Strawberry Butte. A northern tributary to Coon Creek is locally known as "Dry Creek." The majority of the Black Butte copper deposit lies beneath the Dry Creek watershed. The proposed aquifer tests would be conducted on wells located north of Dry Creek. Water monitoring locations on Dry Creek include springs SP-2 and SP-6. Surface water monitoring location SW-3 is located on Coon Creek below its confluence with Dry Creek. Measured flows at SW-3 during the baseline data collection period (May 2011 – November 2013) have ranged from a low of 35 gallons per minute (gpm) up to 2200 gpm. Butte Creek drains the area west of Black Butte, and flows into Sheep Creek approximately 7 miles northwest of the project area. Butte Creek is approximately 2 miles west of the proposed LAD site, which would be located on a saddle between the Butte Creek and Sheep Creek watersheds. An unnamed tributary of Butte Creek drains the western portion of the proposed LAD site. Monitoring locations on this tributary include developed spring DS-3, located approximately 470 feet west of the proposed LAD site (see Figure 3), and surface water site SW-5, located one mile west of the proposed LAD site. Site SW-5 has been monitored quarterly since 2011, and has been

consistently dry with the exception of the May monitoring events. The tributary joins Butte Creek approximately one mile southwest of monitoring site SW-5.

The proposed aquifer tests would be conducted for sufficiently short durations and involve low volumes of extracted groundwater such that stream flows would not be impacted, while providing data to assess what effects long term dewatering during mining might have on flows.

No impacts to surface water would result from the irrigation of water extracted from wells during the aquifer tests, as the water would be discharged in the LAD area at less than the rate of agronomic uptake, which would prevent runoff or discharge to surface water. Water application would be at or less than 90% of the normal year net irrigations requirement (see Table 1).

POTENTIAL GROUNDWATER IMPACTS

There would be no potential impacts to groundwater quality and minimal short-term effects on groundwater quantity associated with the proposed action.

Three six-inch diameter test wells having depths of 200, 300, and 400 feet and a two-inch diameter, 250-foot deep monitoring well are being installed to obtain information on the hydrologic characteristics of the lower zone of the bedrock aquifer. In addition to these four wells, up to 15 other existing wells and piezometers and two surface water sites in the project area would be monitored during the aquifer tests.

The sections below provide summaries of current information on aquifer characteristics in the Black Butte Copper project area.

The proposed action includes conducting pumping tests on these three new wells (PW-8, PW-9, and PW-10) as well as water quality/water level monitoring of these wells and other existing wells. Well PW-8 will be completed above the mineralized zone in the portion of the Lower Newland Formation known as the YNL-A. The well is assumed to have similar water chemistry and aquifer conductivity properties as PW-3, which was also completed in the YNL-A. Based upon testing of PW-3 during 2012, it is estimated that PW-8 would be pumped at 30 gallons per minute for up to 30 days in order to sufficiently stress the aquifer to observe drawdown in surrounding observation wells. Well PW-9 will be completed within the upper mineralized zone (known as the Upper Copper Zone or UCZ), and is assumed to have similar water chemistry and aquifer conductivity properties as PW-4, which was also completed in this zone 750 feet to the east. Based upon testing of PW-4 during 2012, it is estimated that PW-9 would be pumped at 5 gallons per minute for up to 30 days. Well PW-10 will be completed below the mineralized zone, in the

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	portion of the Lower Newland Formation known as the YNL-B. No wells in the project area have previously been completed in this geologic unit, and the proposed 24 hour pump test of PW-10 will provide quantitative information on the hydrologic characteristics of this unit. Well PW-10 would be pumped at 30 gpm for 24 hours. Previous aquifer tests have indicated that the YNL-A geologic unit has a relatively high hydraulic conductivity in the 1.1 to 2.2 feet per day range (determined from pumping well PW-3), while the underlying Upper Sulfide Zone (USZ) has a substantially lower hydraulic conductivity ranging from 0.01 feet per day near well PW-4 up to 0.29 feet per day near well PW-2. The new well PW-9 is located mid-way between these other two test wells previously completed within the USZ and will provide further characterization of the hydraulic properties of the USZ and the UCZ as well as information on the degree of connectivity between this unit and adjacent aquifers. Water levels in piezometers installed near Dry Creek, Coon Creek, and Sheep Creek will be monitored to further characterize the potential for dewatering of bedrock aquifers to influence alluvial groundwater along these streams and potentially affect stream flow. Water extracted from the pumping wells during the aquifer tests would be irrigated over a land application area that would be sufficiently large (40 acres) that all of the water would be consumed by evapotranspiration and no discharge to groundwater beneath the LAD area would occur. Water application throughout the LAD area would be maintained at or less than 90% of the normal year net irrigations requirement (see Table 1). Therefore, no impacts to groundwater beyond short term drawdown near the pumping wells are expected.
3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?	[N] Existing air quality is good as there is a lack of emission sources in the area other than occasional forest fires. Existing air quality has been unimpaired by exploration activities to date. There would be no potential impacts to air quality associated with the proposed action.
4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?	[N] The USGS land use survey indicates that rangeland is the predominate use in the LAD area. The LAD area supports a diverse vegetation complex of upland grasses, sedges and forbs with minor moss, shrub and tree (conifer and deciduous) components. Site vegetation cover is uniform across low gradient terrain at an elevation of approximately 6,000 feet. There would be no significant impacts to vegetation due to the application of water to the LAD area. Reclaimed areas would be seeded with a native seed mixture recommended by the Department, which would be applied in the late fall or early spring to reduce the invasion of noxious weeds. Tintina has submitted a county approved weed control plan for the all lands

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	disturbed under the amendment to the exploration license. Tintina is bonded for and conducts active weed control on surface disturbances.
5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?	[N] Reconnaissance level baseline wildlife studies were conducted in 2011 to characterize wildlife habitat and assess the potential for animal species of concern to be present within the proposed project area. Databases maintained by the Montana Natural Heritage Program and Montana Department of Fish, Wildlife & Parks (FWP) were also queried to obtain natural resources information relevant to the project area. There is no substantial use of the area by important wildlife, birds or fish. Wildlife species or their sign (tracks, scats, skeletal remains, nests, beds, or calls) observed during field studies in the area include white-tailed deer, mule deer, elk, coyote, beaver, Richardson's ground squirrel, pocket gopher, red-tailed hawk, Swainson's hawk, northern harrier, kestrel, Canada goose, Clark's nutcracker, eastern kingbird, barn swallow, tree swallow, savannah sparrow, lark sparrow, gold finch, rock dove, northern flicker, yellow-rumped warbler, mourning dove, raven, American robin, ruffed grouse, magpie, and red-winged blackbird. No impacts to wildlife are expected to occur.
6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?	[N] There would be no potential impacts to unique, endangered, fragile or limited environmental resources associated with the proposed action. It is likely that brook trout, rainbow trout, westslope cutthroat trout, and hybrids of rainbow and westslope cutthroat trout are present in waters of the project area. Wildlife Species of Concern (SOC) were not observed during the 2011 survey and are not recorded as present within the project area, but SOC have been identified in Meagher County (MNHP, 2011). The only species of concern observed in the general area to date is the Clark's nutcracker. The habitat types frequented by some of these SOC are associated with habitats that are present within the area (i.e., conifer forests, grasslands, streams/riparian areas) suggesting that SOC could also be present within the area. In the case of far-ranging wildlife, it is likely that the general area comprises only a relatively small proportion of the total range used by such wildlife during the year. Other SOC found in Meagher County that have a high potential of occurring in the area include northern goshawk, Brewer's sparrow, Cassin's finch, golden eagle, hoary bat, fringed myotis, western toad, and westslope cutthroat trout. The habitat required for lynx and wolverine is mixed coniferous forests. The area is located adjacent to a small stand of primarily Douglas fir forest and sagebrush grasslands which is not preferred

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	habitat for lynx and wolverine. Lynx and wolverine may pass through the area on occasion but they would not stay. Sheep Creek and Little Sheep Creek are perennial streams that meander through a broad floodplain of sub-irrigated meadows and shrub-dominated wetlands. Sheep Creek has riffles and pools with cobble and gravel substrates. There is evidence of abandoned beaver dams, and oxbows are a prominent feature of the broad floodplain area. No impacts are expected to occur. ***Wetlands Delineation*** A wetland survey identified one wetland associated with Dry Creek. This wetland would not be impacted by the aquifer tests due to the short duration of the tests. Additionally, in the Draft EA (DEQ 2014) prepared for the proposed decline DEQ concluded that surface water and groundwater resources in wetlands would not be impacted by the proposed exploration program. Piezometers would be installed between the pumping well and the wetlands to measure water levels. No impacts are expected to occur.
7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	[N] A pedestrian inventory in 2012 recorded seven prehistoric sites, three historic sites, and two prospect pits. No sites were identified in the area of the pumping wells, storage pond(s), or LAD area in this proposed action.
8. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Wi ll there be excessive noise or light?	[N] There would be no potential impacts to aesthetics associated with the proposed action as it is located in a rural area. There will be no excessive noise or light.
9. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, and AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project?	[N] There would be no demands on resources that are limited in the area associated with the proposed action. Line power is available near the site.
10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other	[N] There are no other activities nearby that would affect the project.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
activities nearby that will affect the project?	

IMPACTS ON THE HUMAN POPULATION	
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[N] The proposed action would not add to health and safety risks in the area.
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[N] There would be no potential impacts to industrial, commercial or agricultural activities and production associated with the proposed action.
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	[N] The proposed action would not create, move or eliminate jobs.
14. LOCAL AND STATE TAX BASE AND T AX REVENUES: Will the project create or eliminate tax revenue?	[N] There would be minor increments of state and local taxes generated by purchase of supplies.
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?	[N] There would be no substantial traffic added to existing roads associated with the proposed action. No other government services will be needed.
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[Y] A weed control plan has been approved by Meagher County.
17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?	[N] There would be no change in access to and quality of recreational and wilderness activities associated with the proposed action.
18. DENSITY AND DISTRIBUTION OF	[N] There would be no change in density and distribution of population and housing associated with the proposed action.

IMPACTS ON THE HUMAN POPULATION	
POPULATION AND HOUSING: Will the project add to the population and require additional housing?	
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N] The proposed action will have no impact on social structures and mores.
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[N] The proposed action will not cause a shift in any unique quality of the area.
21. PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required.	[Y]
22. PRIVATE PROPERTY IMPACTS: Does the proposed regulatory action restrict the use of the regulated person's private property? If not, no further analysis is required.	[N] In 1995, the Montana Legislature amended MEPA to require state agencies to evaluate in their environmental documents any regulatory restrictions proposed to be imposed on the use of private property. Section 75-1-201(1)(b)(iv)(D), MCA. Alternatives and mitigation measures designed to make the project meet minimum environmental standards with implementation methods specifically required by federal or state laws and regulations are excluded from evaluation under the implementing guidelines for Section 75-1-201(1)(1)(b)(iv)(D), MCA. Approval of this modification to Tintina's exploration license facilitates Tintina's proposed exploration for minerals on private land. The conditions imposed by the Department in amending the exploration license are designed to make the project meet minimum environmental standards or have been proposed and/or agreed to by Tintina. Thus, the conditions do not constitute a compensable taking of private property.
23. PRIVATE PROPERTY IMPACTS: Does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction	[N/A]

IMPACTS ON THE HUMAN POPULATION	
will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives.	
24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	[N]

25. Alternatives Considered:

No Action: Under the no action alternative, the DEQ would deny the modification to the exploration license. Tintina would have the option of terminating the project or propose another alternative.

Approval: Approval would allow continuation of the exploration project as proposed.

Approval with modification: In the event that prolonged rainfall during the pumping tests precludes discharge to the LAD area at agronomic rates for a period longer than the water can be contained in the holding pond, Tintina would either temporarily store excess water in tanks or interrupt the pumping test.

26. Public Involvement: There would be a public comment period. This Checklist EA will be placed on the DEQ website, and public notice will be issued on the availability of this EA.

27. Other Governmental Agencies with Jurisdiction: Meagher County

28. Magnitude and Significance of Potential Impacts: There would be no significant impacts associated with this proposal.

29. Cumulative Effects: None

Recommendation for Further Environmental Analysis:

[ ] EIS [ ] More Detailed EA [X] No Further Analysis

DEQ has considered the criteria set forth in ARM 17.4.608 and has determined that an EA is an appropriate level of analysis. As reflected in this Expanded Checklist EA, non of the adverse effects of the impacts resulting from the proposed tests are significant. Impacts that do result from the pumping tests will be of limited geographic extent and duration. Other than temporary localized lowering of the water table during the pumping tests, there will be no impacts to surface or ground water, which are important resources to this area and the state. Water extracted by teh pumping tests will be land applied at no more than 90% of the agronomic rate, resulting in no discharge to ground or surface water. The minor ground disturbances resulting from the pumping test will be recontoured, if neeed, and revegetated.

The DEQ has selected the Approve the Agency Modified Plan as the preferred alternative.

EA Checklist Prepared By: Betsy Hovda (Environmental Specialist), Wayne Jepson (Hydrogeologist), and Herb Rolfes (Operating Permit Section Supervisor)

Reviewed by: Robert Cronholm (Exploration Program Supervisor) and Warren McCullough (Bureau Chief)

FOR

Warren D. McCullough. Chief, Environmental Management Bureau, DEQ

6/30/14

DATE

REFERENCES CITED

Chang, et al., 1995. Developing Human Health-related Chemical Guidelines for Reclaimed Wastewater and Sewage Sludge Applications in Agriculture, WHO/EOS/95.20, World Health Organization, Geneva, 114 pp.

DEQ, 2014. Draft EA, Tintina Alaska Exploration, Inc., Black Butte Copper Project, Meagher County, MT, Exploration License #00710

Hydrometrics, 2014**.** Table 1. Irrigation Water Requirements Calculated Average Monthly Water Requirements for Pasture Grass. 2014 Hydrologic Investigation Aquifer Testing Work Plan, Black Butte Copper Project.

U.S. EPA, 2006. Process Design Manual – Land Treatment of Municipal Wastewater Effluents. U. S. Environmental Protection Agency EPA/625/R-06/016

TABLE 1: IRRIGATION WATER REQUIREMENTS CALCULATED AVERAGE MONTHLY WATER REQUIREMENTS FOR PASTURE GRASS (4)

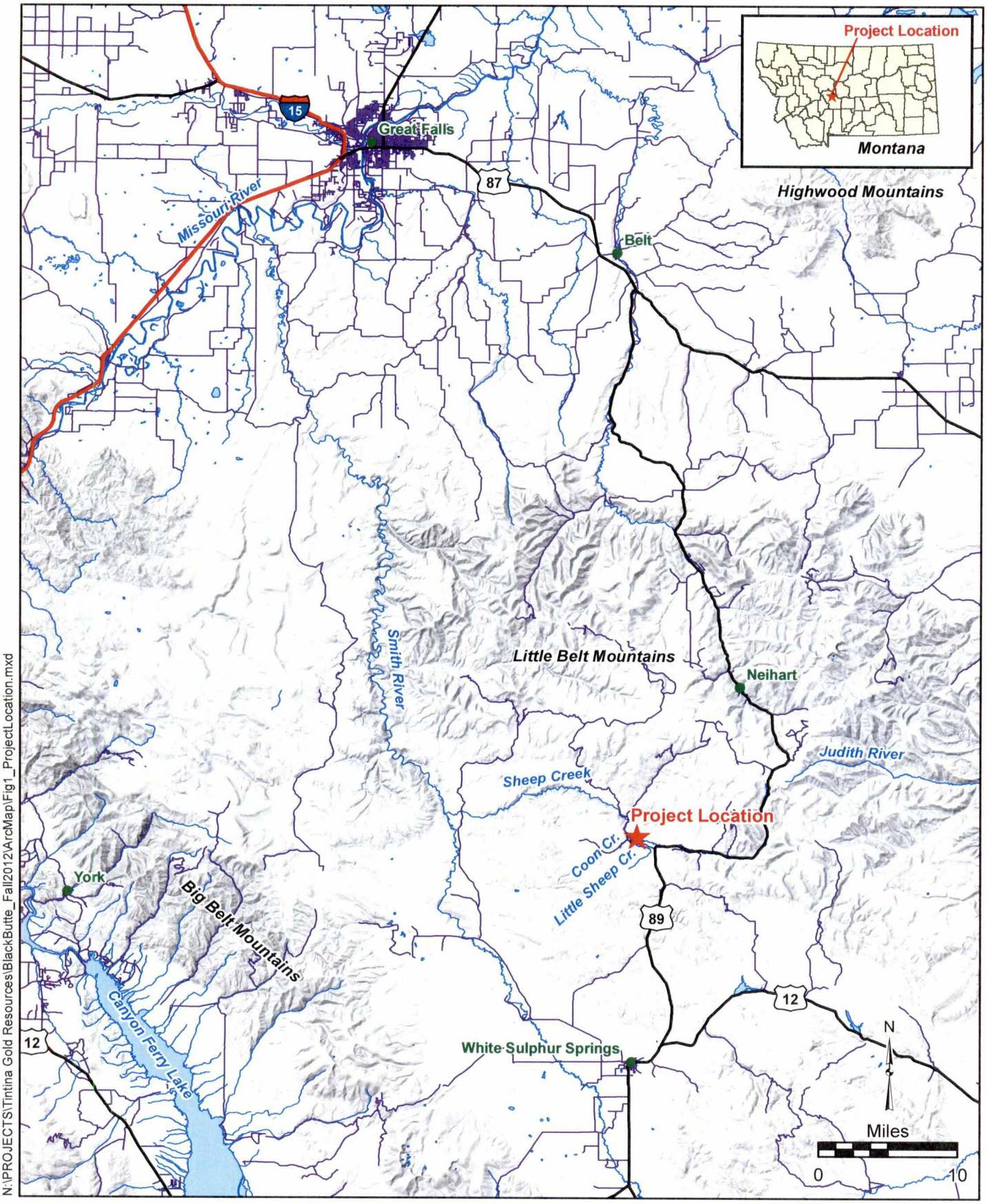
Month	Total Monthly ET (3) inches	Normal Year 50% Chance (1)		Average Daily ET inches	Peak Daily ET inches
		Effective Precipitation inches	Net Irrigation Requirements inches (2)		
January	0.00	0.00	0.00	0.00	
February	0.00	0.00	0.00	0.00	
March	0.00	0.00	0.00	0.00	
April	0.69	0.19	0.00	0.06	
May	2.91	1.11	1.80	0.09	0.11
June	4.38	1.21	3.17	0.15	0.17
July	5.74	0.98	4.76	0.19	0.23
August	5.18	0.66	4.52	0.17	0.20
September	2.76	0.57	2.19	0.09	0.10
October	0.99	0.28	0.21	0.05	
November	0.00	0.00	0.00	0.00	
December	0.00	0.00	0.00	0.00	
Total	**22.64**	**4.99**	**16.65**		

(1) For 50 percent chance of occurrence, effective precipitation will be equaled 1 out of 2 years.

(2) Net Irrigation requirements are adjusted for carryover moisture used at the beginning of the season and carryover moisture used at the end of the growing season.

(3) Evapotranspiration (ET) is adjusted upwards 10% per 1000 meters above sea level.

(4) The LAD system will be designed to apply water to a LAD area at a rate below the normal evapotranspiration (ET) rate throughout the discharge period to ensure zero discharge to groundwater or surface water. The available application rate for the LAD area was calculated using the NRCS Irrigation Water Requirements (IWR) software program for pasture grass. The White Sulphur Springs weather station was used for the climate data with a correction based on the LAD elevation (6000 ft amsl). Table 1 summarizes the calculated average monthly water requirements for pasture grass for the irrigation season.



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Project Location
City
Interstate
U.S. Route
Local Road
Stream
Lake

Figure 1
Project Location
Black Butte Copper Project
Meagher County, Montana

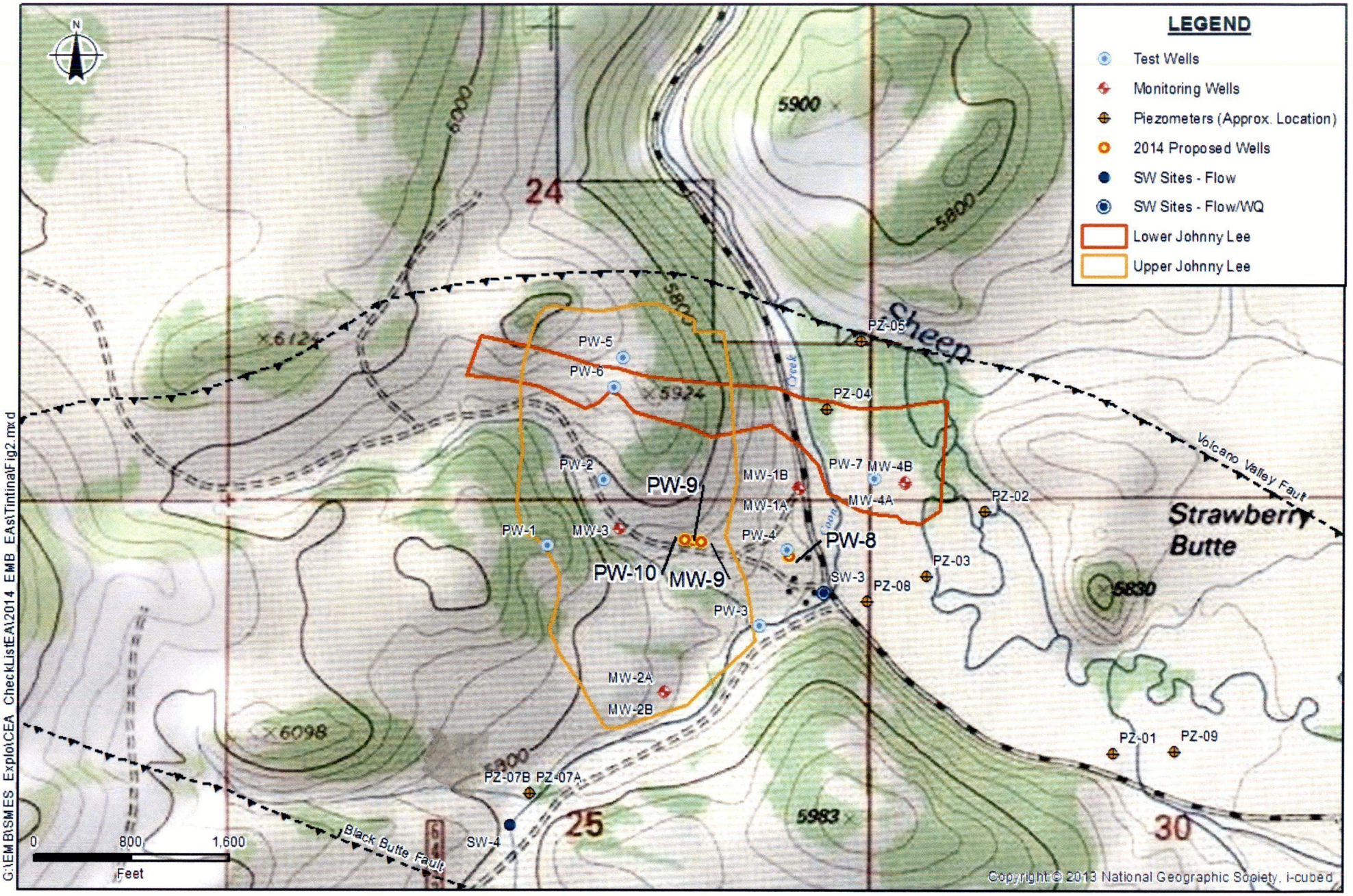

Figure 2
Proposed Well Locations
Black Butte Copper Project
Meagher County, Montana

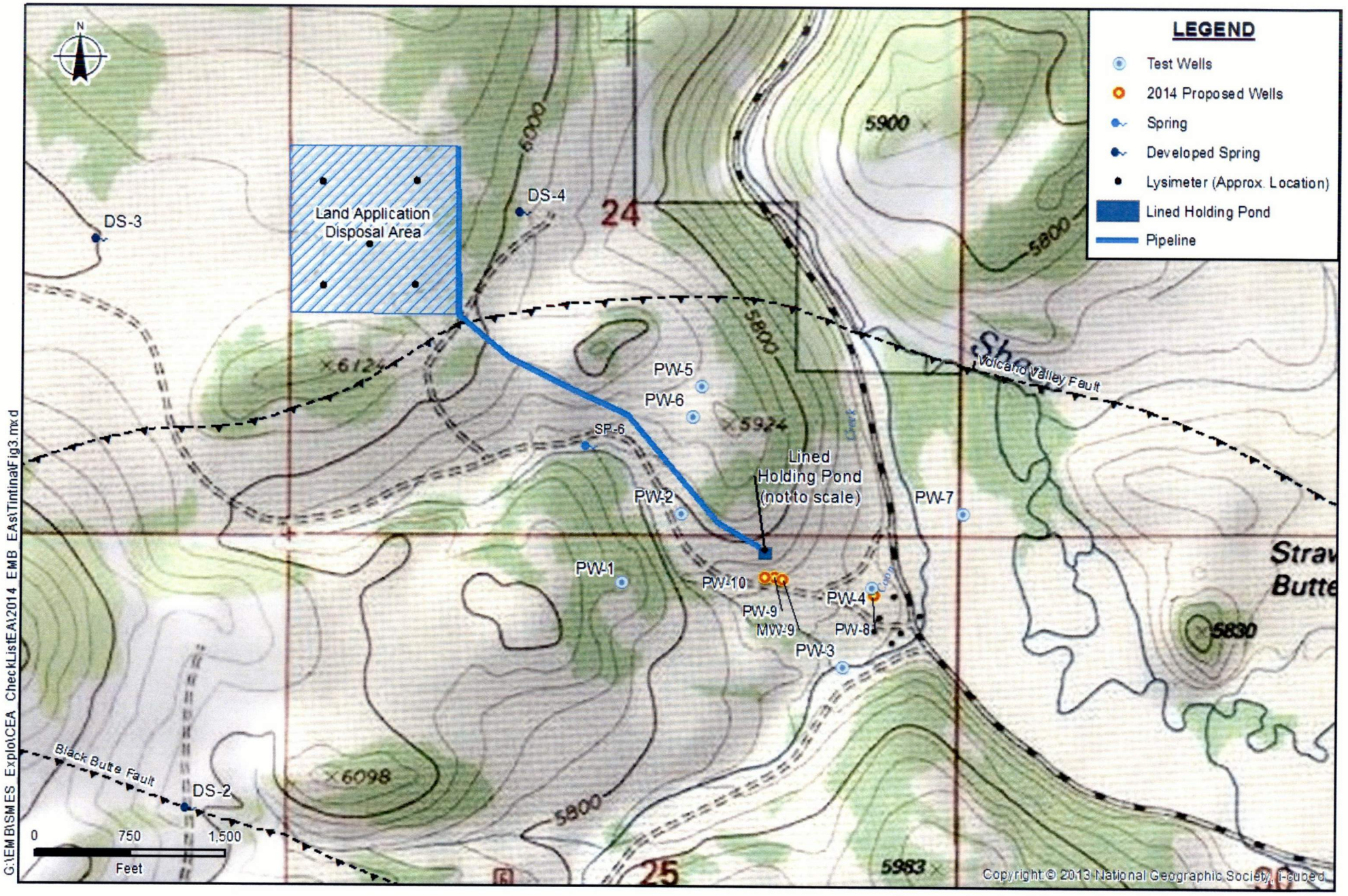

Figure 3
Water Disposal Layout
Black Butte Copper Project
Meagher County, Montana

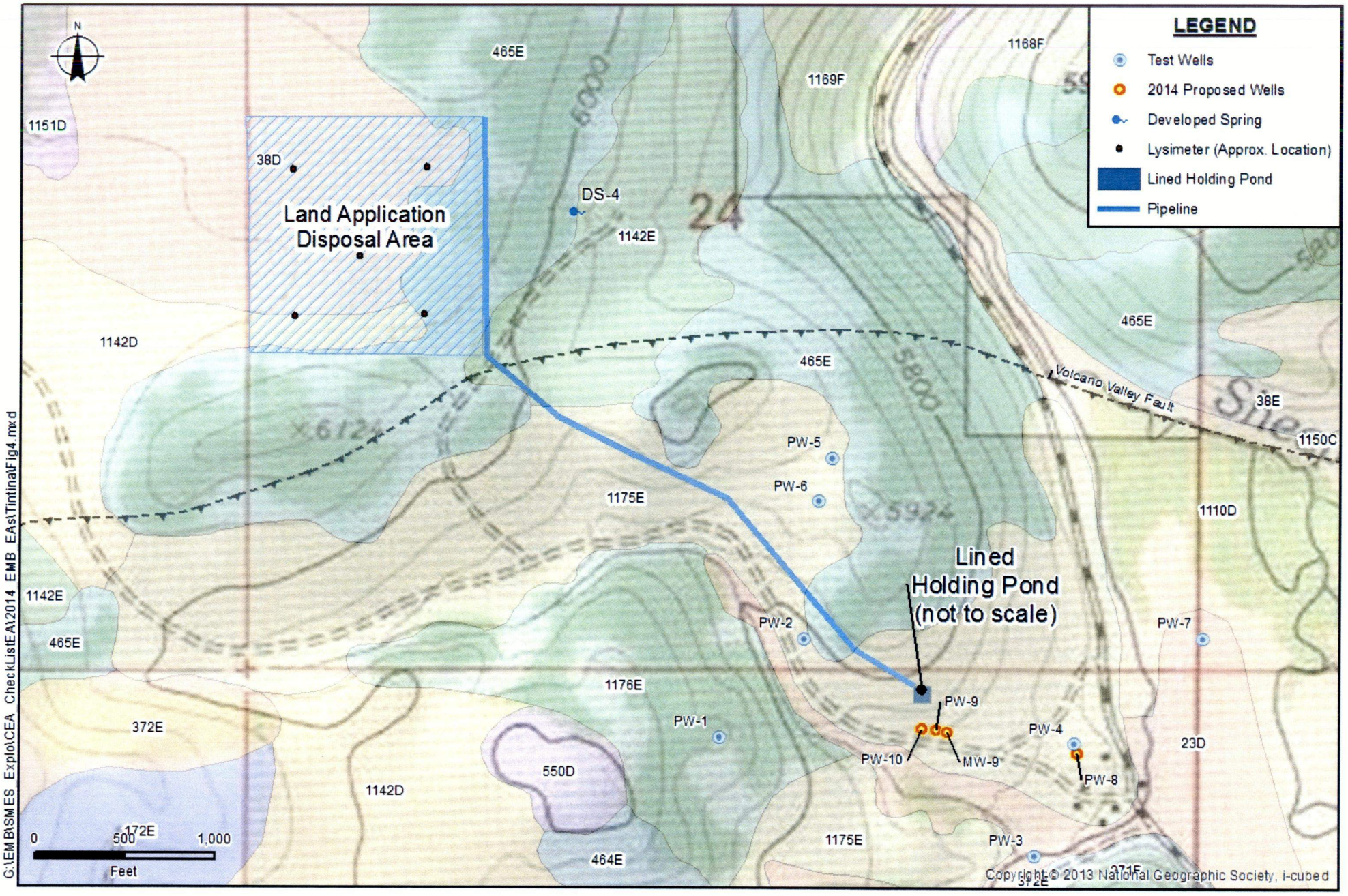

Figure 4
LAD Area Soil Types
Black Butte Copper Project
Meagher County, Montana