

Moffatt Thomas
MOFFATT THOMAS BARRETT ROCK & FIELDS, CHTD.

US Bank Plaza Building
101 S Capitol Blvd 10th Fl
PO Box 829
Boise Idaho 83701 0829

208 345 2000
208 385 5384 Fax
208 385 5323 Direct

FACSIMILE

From: Scott L. Campbell

Date: August 20, 2004

Re: Thompson Creek Biological Assessment

File No.: 18976.4

Number of pages being transmitted including the cover page: 20
Please call fax operator at (208) 345-2000 if all pages are not received.

	Name	Organization	Fax No.	Voice No.
To:	Allen Merritt	Idaho Department of Water Resources Southern Region Office	208-736-3037	208-736-3033

Message:

Allen,

Pursuant to our telephone conversation, I have attached the draft biological assessment.

Scott

PLEASE DELIVER IMMEDIATELY

The information contained in this facsimile message is attorney privileged and confidential information intended only for the use of the individual or entity named above. If you have received this communication in error, please immediately notify us by telephone to arrange for return of the original document to us. Thank you.

RECEIVED

AUG 20 2004

Department of Water Resources
Southern Region

REVIEW DRAFT**I. Background Information**

Thompson Creek Mining Company (TCMC) proposes to build a pipeline along an existing road to aid in water management at the mine and will allow recycling of site runoff water. Currently, runoff and seepage from the Buckskin waste dump discharges directly into Buckskin Creek; runoff and seepage from the Pat Hughes waste dump discharges directly into Pat Hughes Creek. Both of these discharges are authorized by an Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) permit No. Id-002540-2. In addition to water management, the pipeline will permit TCMC to consistently comply with surface water quality criteria for selenium during low flow conditions on Thompson Creek below Buckskin Creek as well as meet various effluent limitations on Pat Hughes Creek during periods of high flow (which discharge is currently pumped up to the mill through a pump system at the base of the Pat Hughes waste rock dump).

II. Proposed Action

Project consists of constructing an underground water conveyance pipeline from the Pat Hughes and Buckskin Creek waste rock dumps on the minesite to the Cherry Creek pump station where it will be pumped to a water tank for recovery and re-use in the mill. The pipeline corridor will be within the right-of-way along Thompson Creek Road and from each waste rock dump to Thompson Creek Road.

The Thompson Creek underground pipeline will route runoff and seepage water collected at the base of the Buckskin waste rock dump along with two small springs below the Buckskin sediment pond along the Thompson Creek drainage to the Pat Hughes Creek drainage. Pat Hughes runoff and seepage water collected at the base of the Pat Hughes waste rock dump will join this pipeline and the water will be routed to an existing water storage tank located at the mouth of Cherry Creek. From this point, water will be pumped up to the TCM mill for use as process water. The pipeline will consist of inlet structures, 18-inch high-density polyethylene (HDPE) pipe, a flow control valve vault, a shut-off valve vault and a connection to the existing Cherry Creek pipeline.

The Buckskin Creek pipeline will begin at the existing Buckskin sediment pond outlet. It will follow the alignment of the sediment pond access road picking up flows from two small springs and then follow the access road to where it meets the Thompson Creek Road. It will then generally follow the alignment of the Thompson Creek Road to the intersection with the Pat Hughes sediment pond access road. The pipeline will connect with the pipeline from the Pat Hughes sediment pond outlet at this location.

The Pat Hughes pipeline begins at the Pat Hughes sediment pond outlet. From there, the pipeline alignment follows the Pat Hughes sediment pond access road to its intersection with the Thompson Creek Road and the Thompson Creek pipeline. The Pat Hughes pipeline connects to the Thompson Creek pipeline at this location.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

The Thompson Creek pipeline continues to follow the Thompson Creek Road alignment to a location near the mouth of Cherry Creek. The pipeline is then routed along the slope on the north side of Thompson Creek to the Cherry Creek water tank. See Plan Sheets 3 and 4 for a plan view of the pipeline alignment.

Pipeline Characteristics

The Buckskin Creek to Pat Hughes Creek portion of the pipeline will be approximately 2.8 miles in length, with a design capacity of 3,600 gallons per minute (gpm). The Pat Hughes Creek to Cherry Creek portion of the pipeline will be approximately 1.5 miles in length, including the portion of the pipeline from the Pat Hughes sediment pond to the confluence with the Thompson Creek pipeline. The design capacity of the pipeline segment from the Pat Hughes sediment pond to the confluence with the Thompson Creek pipeline is 4,950 gpm. The design capacity of the pipeline from this confluence to the Cherry Creek water tank is 8,550 gpm. Pipeline materials will be fusion-welded HDPE, with a pressure rating sufficient to withstand static pressure developed within the pipe. Mechanical valves and associated fittings will be steel or bronze alloys. The Buckskin intake structure will utilize reinforced concrete walls and slab, with a galvanized steel debris grate. This intake will contain a bypass valve that can divert flow directly to Buckskin Creek. The Pat Hughes pipeline will be directly connected to the Pat Hughes sediment pond outlet pipe, with a bypass valve that allows water to be diverted through the existing outlet weir below the sediment pond directly to Pat Hughes Creek. Valve vaults will be constructed of reinforced concrete.

Construction of the pipeline would result in surface disturbance approximately 20 to 40 feet wide maximum and 4.3 miles long for a maximum total of approximately 23 acres. Much of the construction will occur in the already disturbed roadway; some will take place directly adjacent to the roadway right-of-way. Excavated material will total approximately 23,500 cubic yards of earth, which will be used to backfill and recontour the trench and roadway. Excess material will be spread and used for roadbase, recontouring roadway, and for restoring the disturbed area to preconstruction conditions.

Although construction will occur in late-fall, during excavation the potential exists for encountering the water table. At such points water and sediments will be pumped from the trench and land-applied along the toe of the slope on the opposite side of the road from Thompson Creek. BMP and runoff water management will use hay bales, silt fences, application rates, and other control as needed to assure that discolored water does not enter Thompson Creek. The construction specification for the pipeline will include provisions for water-blocks in the trench, during and after construction to prevent surface and groundwater from channeling through the trench excavation. During construction the water blocks will be placed above the road crossing culverts to prevent construction/trench water from entering the creek. After construction the water blocks will be below culvert crossings to encourage drainage and discourage flooding.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

Access to the site is over the existing Forest Road #040 sometimes referred to as the Thompson Creek Road. Initially, construction equipment will be stored in an area located just upstream of the mouth of Pat Hughes Creek. As installation progresses there are two previously disturbed, flat areas that will be used, one at the mouth of Buckskin Creek and one downstream of the mouth of Cherry Creek. Staging areas would be protected from potential leaks and spills by hay bales. In accordance with the National Pollutant Discharge Elimination System construction stormwater permit TCMC has prepared a stormwater pollution prevention plan (SWPPP). This general plans details mitigation measures and best management practices to control pollutants from runoff during storm events. Construction will take place in the late fall and early winter when little precipitation is expected, minimizing any significant impacts from stormwater runoff. Impacts to the staging areas will be limited to tire disturbance from vehicular traffic.

Construction of the new inlet structures will entail working in Buckskin Creek stream channel adjacent to the existing sediment pond outlet structures and the outlets for the two springs. This stream flows intermittently, typically during the spring runoff and early summer. Construction of the inlet structures will disturb less than 25 feet of stream channel. The existing stream channel consists of rock riprap placed for erosion protection.

The pipeline alignment will cross several intermittent drainages (Buckskin Creek, Pat Hughes Creek and three unnamed seasonal drainages) along the alignment of the Thompson Creek Road. At these locations, water is routed through existing metal culverts beneath the Thompson Creek Road. See Plan Sheet for locations. Of these drainages only Buckskin Creek typically has flows during the late fall/winter construction period. Flows less than 50 gpm are expected. During construction surface flow will be routed around the excavation activity in the streambed using pipes, pumps, and or diversions. Stream channel will be restored to grade and contour following construction, using native rock for erosion control.

The flow in the Thompson Creek pipeline between the two inlets and the Cherry Creek water tank will be controlled with a motorized valve located near the water tank. This valve will normally be open, allowing water to gravity flow into the tank. If there is not a mill water requirement to be filled from the water tank, the valve can be closed, which will result in water diverting into the Pat Hughes sediment pond. If water needs to be drained from the pond in this instance, the bypass valve near the sediment pond outlet weir can be opened and water can be discharged into Pat Hughes Creek below the sediment pond.

Water discharged from Pat Hughes would continue to be subject to NPDES permit conditions for Outfall 002. Similarly, water discharged to Thompson Creek from Buckskin Creek would continue to be subject to NPDES permit conditions for Outfall 001.

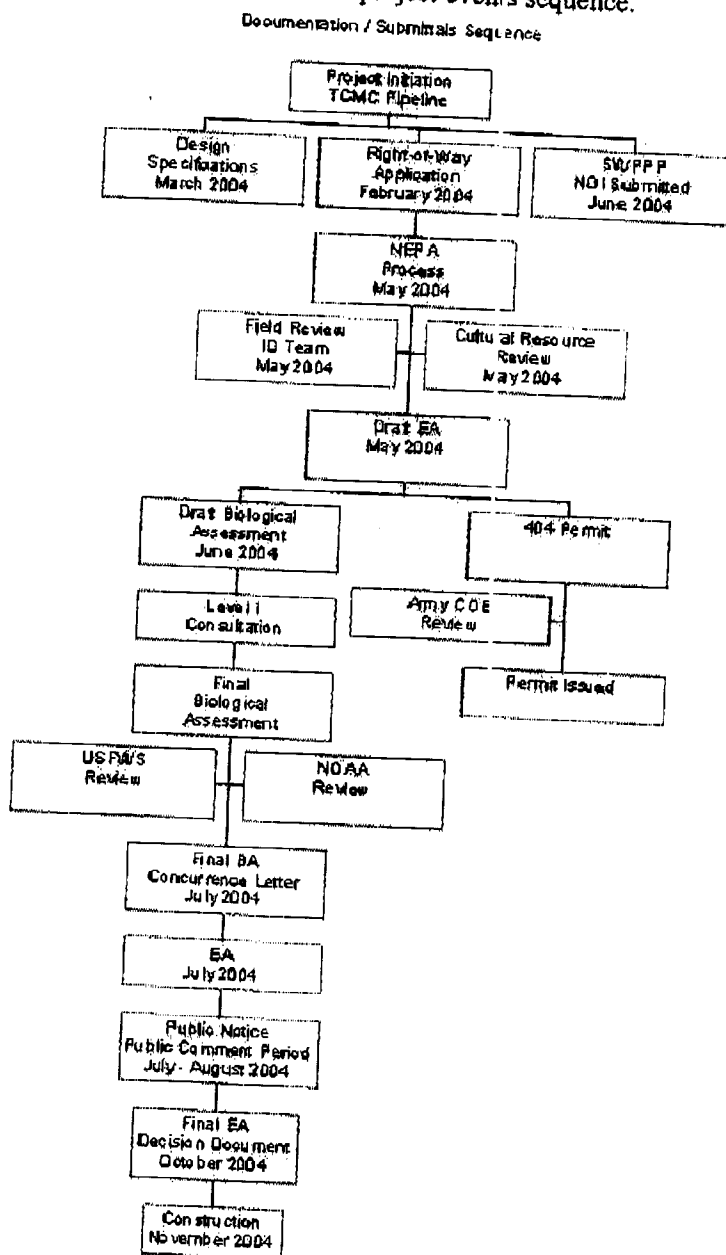
DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

Project Timeline

The following diagram demonstrates the project events sequence.



DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

III. List of Species

Five priority fish species exist in the resource area. The Snake River steelhead trout, Columbia River Basin bull trout, Snake River spring/summer Chinook salmon, and Snake River sockeye salmon are federally listed. The Westslope cutthroat trout is listed by the State of Idaho as a species of concern. Priority fish species have special significance for management in the resource area. Thompson Creek is a priority stream requiring that activities along fish-bearing streams are designed, constructed, and operated so as not to hinder attainment of the riparian and aquatic habitat conditions (*Challis Proposed Resource Management Plan and EIS, 1998*).

The National Oceanic and Atmospheric Administration (NOAA Fisheries) and US Fish and Wildlife Service (USFWS) list two fish species that occur, and/or whose habitat exists, within the scope of the project area as either endangered or threatened under the Endangered Species Act of 1973: Snake River steelhead trout and Columbia River Basin bull trout. These two species were identified in the Thompson Creek Subwatershed studies biological assessments by the BLM. Thompson Creek is considered to contain two listed anadromous species, Snake River steelhead trout and Snake River spring/summer Chinook salmon, though Chinook salmon have not been observed upstream of the mouth of Thompson Creek. One listed resident species is known in Thompson Creek, Columbia River Basin bull trout.

Snake River sockeye salmon are only present in the Salmon River and should not be affected by the project because the work will be performed when sockeye are not migrating past the Thompson Creek/Salmon River confluence.

Snake River spring/summer Chinook salmon have not been observed upstream beyond the mouth of Thompson Creek. Protection of habitat values for Snake River steelhead trout and Columbia River Basin bull trout will also be protective of Snake River sockeye and spring/summer Chinook salmon habitat values.

Threatened wildlife species present in central Idaho include the lynx, peregrine falcon, gray wolf, and bald eagle. Recent surveys have not been conducted for these species. It is assumed that they could be present, however none are known to inhabit the project area. No impact is anticipated to wildlife species due to short project duration, and the fact that the trench will be closed shortly after opening.

IV. Description of Project Area

The Thompson Creek study area is located in Custer County, Idaho, approximately 30 miles southwest of Challis Idaho. The study area lies within portions of Sections 4, 9, 10, 11, 13, and 14, Township 11 North, Range 16 East. The study area is contained on the Thompson Creek USGS 7.5-minute quadrangle map. See Plan Sheet 1 for project location.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

The climate in the Thompson Creek study area is influenced by cool, moist maritime air masses in the late fall and early spring, and cold, dry continental air from Canada in winter. Summers are considered dry as most precipitation occurs in the form of snow during winter months, with most accumulation occurring in late February and early March. Average annual precipitation reported from the Bruno Creek survey station indicates that conditions change from year to year and month to month with maximum snowpack around 53 inches and annual precipitation averages around 20 inches. Relative humidity is considered relatively low, below 25 percent in the summer. Temperatures range from 50 F to 85 F in the summers and from -30 F to 30 F in the winter.

Buckskin Creek and Pat Hughes Creek are tributaries to Thompson Creek. Upstream elevation of Thompson Creek is 9,612 feet. Downstream elevation is 5,580 feet. Slopes exceeding 50-60 percent are common over much of the area. Terrain is characterized by steep rocky slopes. Gradients on Buckskin Creek and Pat Hughes Creek are moderate averaging 3-5 percent. Buckskin and Pat Hughes Creeks are small, one foot wide and three inches deep, clear stream in brushy narrow V-shaped draws. Gradients on the USFS portion of Thompson Creek are generally steep, with an average gradient of 4.7 percent. On BLM lands gradients average 2.9 percent on the mainstream of Thompson Creek.

Streamside vegetation along Thompson Creek and its tributaries consists of cottonwood, aspen, willow and alder. Aquatic surveys indicate 70 to 90 percent of streambanks are covered with either vegetation or cobble. Cutbanks up to 2 feet high occur in some places. Shrub and tree regeneration appears to be good.

Buckskin Creek and Pat Hughes Creek have been previously impacted by mining activities. Riparian vegetation on Buckskin Creek and Pat Hughes Creek consists primarily of healthy, dense woody vegetation with lush herbaceous species.

V. Matrix of Diagnostic Pathways and Indicators

The determination of effects matrix attached to this document was used to evaluate the existing condition in Thompson Creek, Buckskin Creek and Pat Hughes Creek and assess the potential effects from constructing the pipeline along the Thompson Creek Road right-of-way and along Buckskin and Pat Hughes Creeks. None of the habitat features or functions in the matrix will be degraded as a result of the project.

VI. Description of the Species and Habitat

Thompson Creek is located in the Upper Salmon Watershed, a fourth field Hydrologic Unit extending from the mouth of the Pahsimeroi River to the headwaters of the Sawtooth Mountains, including the mainstem Salmon River and tributaries. The area covers 2,410 square miles and contains 3,251 miles of streams. Eighty-nine percent of

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

this area is in public ownership, managed by the Federal government. There are three listed species known to occupy Thompson Creek; Chinook salmon in the lower section, and steelhead and bull trout in the project area. These species are listed under the terms of the Endangered Species Act of 1973. There are no listed fish species known to exist in Buckskin Creek or Pat Hughes Creek.

Eighteen local bull trout populations have been identified in the Upper Salmon Watershed (*Bull Trout Draft Recovery Plan, Chapter 17, USFWS, 2002*). Thompson Creek has a local population of bull trout according to the IDFG, 2002. Migratory bull trout have been captured while trapping Chinook salmon in the mainstem Salmon River since 1986. Bull trout also exist in the Yankee Fork, mainstem Challis Creek, Valley Creek, Fourth of July Creek, and Morgan Creek. All bull trout populations in the Upper Salmon Watershed were listed as threatened in 1998 under the ESA. The Upper Salmon Watershed is part of the Salmon River recovery unit of the Columbia River distinct population segment. A draft recovery plan was published by the USFWS in 2003 delineating actions that are believed necessary to recover and/or protect the species. General life history and status information can be found in the Final Rule of the Federal Register and in the state of Idaho Bull Trout Conservation Plan (1996).

Bull trout are sensitive to stream habitat and watershed conditions. Bull trout typically have more narrowly defined habitat tolerances than other salmonids, with a closer affinity to stream bottom substrate quality and conditions. In-channel woody cover, clean substrate, cold clean water, deep pools, vegetated undercut banks, channel stability, winter high flows and the quality of summer low flows appear to consistently influence bull trout abundance and distribution throughout their range (*USFS, Environmental Assessment for the Proposed Amendments to the Management Indicator Species List for the Salmon and Challis Land and Resource Management Plans, February 2004*). Thompson Creek has been proposed for designation as critical habitat for Columbia River Basin bull trout recovery.

Steelhead is a native type of rainbow trout that are anadromous which means they spawn in freshwater streams, go to the ocean to grow, and return to fresh water as adults. They are common to the Clearwater, Snake and Salmon rivers. Both recent and historical data on the spawning populations of steelhead in specific streams within the Salmon River Subbasin are very limited. Habitat quality is intrinsically related to the quality of upland areas and upstream areas (including headwater or intermittent streams) that provide key habitat elements (e.g., large woody debris, gravel, water quality) crucial for steelhead in downstream reaches.

Idaho's steelhead are often classified into two groups, A-run and B-run, based on their size and ocean life history. Idaho's A-run steelhead are usually found in the Snake and Salmon rivers. They return from the ocean earlier in the year (usually June through August) and they most often return after spending one year in the ocean. Because they

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

return early in the year and because they usually come back after only one year in the ocean, they weigh 4 to 6 pounds and are generally 23 to 26 inches in length.

The B-run steelhead most often return to the Clearwater River, but some return to tributaries in the Salmon River. These fish usually spend two years in the ocean, and start their migration to Idaho later in the summer or fall of the year (usually late August or September). Because of the extra year and the extra summer of growing in the ocean, they return as much bigger fish.

Westslope cutthroat trout are present in the Salmon River and many of its tributaries. Westslope cutthroat trout feed primarily on macroinvertebrates, particularly immature and mature forms of aquatic insects, terrestrial insects, and zooplankton, when in lakes. The preference for macroinvertebrates occurs at all stages, in both streams and lakes. In contrast to other subspecies of cutthroat trout, the Westslope subspecies does not appear to be highly piscivorous. Behnke (1992) attributes the weak development of piscivory by Westslope cutthroat to its evolution with piscivorous species, the bull trout (*Salvelinus confluentus*) and the pike minnow (*Ptychocheilus oregonensis*). By specializing as invertebrate feeders, Westslope cutthroat have avoided direct feeding competition with these other species.

Westslope cutthroat trout usually reach maturity at four to five years of age. Spawning occurs primarily in small tributary streams between March and July, when water temperatures reach about 50°F. Fertilized Westslope cutthroat eggs are deposited in stream gravels where they incubate for several weeks before hatching. Several days after hatching from the egg the fry emerge from the gravel, when they are about one inch in length, and disperse into the stream. The fry may grow to maturity in the spawning stream or they may move downstream and mature in larger rivers or lakes. Three life-history types are recognized in Westslope cutthroat: resident fish, which spend their lives entirely in headwater tributary streams; fluvial fish which spawn in small tributaries and whose young migrate downstream to larger rivers where they grow and mature; and adfluvial fish, which spawn in streams but grow and mature in lakes (Jakober, 1995).

Growth of individual Westslope cutthroat, like that of other fish species, depends largely upon the interaction of food availability and water temperature. Resident fish usually do not grow longer than 30cm (12 inches). This is most likely because they spend their entire lives in small, coldwater tributaries with limited food supplies. Conversely, fluvial and adfluvial fish often grow longer than 30cm (12 inches) and attain weights of 0.9-1.4 kg (2-3 pounds). Such potential for growth only results from the warmer, more productive larger rivers, lakes, and reservoirs.

Westslope cutthroat use the Salmon River as a winter rearing habitat (Table 2) and migrate into the tributaries in the spring as water temperatures and streamflow increases. Spawning occurs in the tributaries from May through mid July and incubation extends through the end of August. Adults and juveniles remain in the tributaries into the fall and

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

migrate back into the Salmon River as water temperatures decline. Because Westslope cutthroat trout will be in the Thompson Creek during the pipeline installation, they could be affected by the proposed project.

VII. Analysis of Effects

This effects assessment focuses on the potential effects to critical riparian habitat features such as streamflow, streambed, and water quality. Continued presence of bull trout and steelhead, and occasional use of the lower reach of Thompson Creek by Chinook smolt validate the continued high quality and suitability of fish habitat in Thompson Creek. It is this existing baseline habitat quality against which potential project effects are evaluated.

Sediment:

Construction traffic and soil disturbance increases the possibility of fine sediment delivery to Thompson Creek. Nearly the entire length of Thompson Creek Road runs within 100 feet of surface water classified as critical habitat, establishing a potential risk of erosion and sediment production during construction. Under normal conditions fines enter Thompson Creek from the roadway and hillslopes experiencing typical erosion from wind and precipitation. Average annual precipitation reported from the Bruno Creek survey station indicates maximum snowpack is around 53 inches and annual rainfall averages around 20 inches. This runoff is completed by June each year with lowest flows in the late fall/winter season.

Buckskin Creek and Pat Hughes Creek are tributaries to Thompson Creek. Upstream elevation of Thompson Creek is 9,612 feet. Downstream elevation is 5,580 feet. Slopes exceeding 50-60 percent are common over much of the area. Terrain is characterized by steep rocky slopes. Gradients on Buckskin Creek and Pat Hughes Creek are moderate averaging 3-5 percent. Gradients on the upstream USFS portion of Thompson Creek are generally steep, with an average gradient of 4.7 percent. On the BLM lands lower in the drainage, gradients average 2.9 percent on the mainstream of Thompson Creek.

Soils in the area are comprised of two types - orthids-dawtonia-cronks complex and cryoborolls-ryochrepts-koffgo complex. The first is composed of gravelly loams, shallow to very deep, well drained, on hilly to extremely steep slopes. Water erosion is rated slight to moderate. The second type is composed of gravelly loamy, steep to extremely steep, well drained soils. The water erosion hazard is moderate to severe. On slopes greater than 35 percent the potential for water erosion is severe if protective vegetation is not maintained.

Little sediment-related impact is anticipated from stormwater. Idaho has seen low water tables due to drought conditions since 2000. Because the project construction period is scheduled for late-fall and early-winter, little rain is expected.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

TCMC has been monitoring sediment and suspended solids loading in Thompson Creek for over 20 years. There are two sediment sampling stations on Thompson Creek, one located above the mine influences and one below. These stations are used to determine the amount of fine sediments entering the streams due to mining operations. Sampling procedures include stream channel substrate core sampling, determination of embeddedness, determination of surface particle size, and the selection of sample sites within 100 yards of spawning areas. The measured percent fines measured in sediment in Thompson Creek has consistently been less than 15-20%. Data indicates sediment levels are presently in acceptable ranges for salmonid reproduction. Water quality data indicate that high sediment concentrations do not generally occur within Thompson Creek, except during the peak of spring runoff and high flow events. Regularly scheduled monitoring activities will continue throughout the length of the project. Sediment management activities and BMPs already in place as part of the Road Management Plan have sufficiently controlled sediment delivery to date.

Project activities, which could introduce fines into fish bearing habitats, include clearing, grubbing, excavation, bedding, and backfilling of the pipeline trench. During the construction of the pipeline, sediment affects to Thompson Creek could occur from constructing pipeline inlet structures, re-routing streams during pipe construction and culvert installation.

Management controls, combined with the SWPPP BMPs, will mitigate impacts from sediment to Thompson Creek during construction of the proposed action. Construction specifications will include:

Clarify where each of the BMPs will be used and how they are expected to reduce the potential for fines to enter Thompson Creek.

- Silt fence and hay bales will be used to border the construction zone near all streams and all stream crossings. This BMP will form a physical barrier retaining overland flow and or sediment in the construction area.
- Culvert openings will be designed to minimize stream sedimentation. The placement of culverts at or below grade will eliminate scour and erosion from culvert ends.
- Drainage controls will be used to minimize erosion of the roadbed and cut and fill slopes. After completion of pipeline construction, a finish grading and restoration of drainage will be conducted. The finish grading will include protection of cut and fill slopes from concentrated runoff to prevent erosion.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

- Construction during late fall and winter will avoid conflicts with spawning or egg incubation and minimize erosion potential.

Channel Morphology:

There will be no effects to the channel of Thompson Creek from project activities. Effects to Pat Hughes Creek channel will be limited to the immediate area of the intake structure; this section of channel is already disturbed and will be dry during construction.

Construction of the new inlet structures will entail working in Buckskin Creek adjacent to the existing sediment pond outlet structures. Construction will disturb less than 25 feet of stream channel. The existing stream channel consists of rock riprap placed for erosion protection. Impact will be minimal as the stream flows intermittently during the year. There will be no surface flows through the Buckskin Creek pond outlet during construction.

Two springs emerge from the hillside above the Buckskin Creek channel. These springs maintain diminished flows in late-fall and early-winter. Water right filings for these springs have been completed, and transfer of existing rights are in the process of being formalized for the excavation of the spring sources, and diversion of their flow into gravity drains. The springs' flow will be transferred to the Buckskin Creek pipeline. Construction disturbance area will be stabilized, re-contoured, and restored to contour as part of the construction program.

There are currently several culverts that transmit water under the roadway. Additional culverts will be installed as part of the project to pass the collected spring water under the Buckskin access road. In addition, the two existing culverts may be replaced with larger or longer culverts to accommodate the final pipeline alignment. These refit culverts will be placed so as not to block fish passage, and will be sized to handle anticipated 100-year flood events. Installing these new culverts will involve the use of a backhoe. Roadway drainage will be returned to preconstruction at culvert sites. On completion of construction the culvert openings on Buckskin and Pat Hughes Creeks will be at or below the natural grade of the streambed.

- Construction that takes place in or near riparian areas and stream channels will be performed during the low water time of year to minimize short-term impacts, and finish grading after construction will eliminate long-term impacts to these areas.

- Construction will accommodate protection of the open stream channel at existing culvert locations if the pipeline alignment needs to be moved outside the road-width due to constructability issues. If this occurs, the two existing culverts under the Thompson Creek road will be extended to account for the extra width.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

- As needed, new additional culverts will be placed to control springs or seeps that flow across the Thompson Creek Road.

Streamflow:

The pipeline will affect Streamflows in Buckskin, Pat Hughes, and Thompson Creek. The diversion of flow from springs and tributaries will have minimal, but measurable affect on Thompson Creek flows. The effects will be seasonal; streamflow diversions resulting from the project will effect less than 20 % of Thompson Creek flow during the peak of high water seasons. Buckskin and Pat Hughes Creeks cease surface flow each year during late fall and winter, so there will be no effect to Thompson Creek flows during low water seasons.

Buckskin Creek and Pat Hughes Creek are main tributaries to Thompson Creek on the west side of the mine. Buckskin and Pat Hughes Creek flows are currently controlled up gradient of the waste rock disposal and pit areas. Buckskin Creek flows through an engineered sub-drain beneath the Buckskin waste rock dump. Pat Hughes Creek currently flows in a French drain constructed of durable waste rock beneath the Pat Hughes waste rock dump. The contributing flow from Buckskin and Pat Hughes Creeks is minimal and varies seasonally (USFWS, Draft BO 1999). Flow in both drainages can drop to zero during the period from September to March.

Thompson Creek is a tributary to the Salmon River extending approximately 15 miles from its confluence with the Salmon River to its headwaters. Peak streamflow occurs during the months of April, May and June. Thompson Creek contributes no more than 5 percent of the Salmon River flow at their confluence (USDA 1994a). The Thompson Creek average annual flow from 1973 to 2002 was 17.2 cfs (USGS data). Flow in Thompson Creek averages 61.7 cfs during the spring snowmelt (USGS data).

Receiving Water: Thompson Creek		
	1998	1999
Buckskin Creek (diverted water as portion of Thompson Creek flow)	0.47 % .033 cfs	6.1% .43 to 8.0 cfs
Pat Hughes Creek (diverted water as portion of Thompson Creek flow)	8.0% .56 cfs	12.5% .875 to 11.0 cfs
Total Flow Diverted	.593 cfs	1.3 to 19.0 cfs

The table is based on the maximum allowable discharge rates from the two permitted outfalls on Thompson Creek. These flow rates are based on the period of record for the watershed, and demonstrate the maximum influence of 100 percent diversions on receiving flow in Thompson Creek. At high flows (>7 cfs) Thompson Creek will remain at >80 percent of flow volume. At low flows, Thompson Creek will remain at >90 percent of flow volume. Note that at historic lowest drought condition flows, Buckskin and Pat Hughes Creeks have contributed no surface flows to Thompson Creek since they are seasonally intermittent.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

Wetlands

A wetlands delineation was conducted before the final design of the pipeline route to avoid sensitive riparian and wetland areas.

The existing Thompson Creek Road is adjacent to wetlands (all of which are located between Thompson Creek and the Thompson Creek Road), and traverses riparian areas along the floor of the Thompson Creek Valley. Land application will be used during construction to provide sediment removal if groundwater is encountered and removed during pipeline excavation. Water from the open trench will be collected and pumped from a presettling basin adjacent to the trench to remove sediments. The land application area(s) will be bermed with hay bales and/or silt fencing. The water pumped from the excavation presettling basins will then be dispersed to upland areas and allowed to infiltrate into the ground. The presettling basins will be designed in accordance with the Idaho Best Management Practices guidance document. Maintenance activities will include management of sediment build-up and replacement as fill into the excavated trench on an as-needed basis. The presettling basins will be dismantled and reclaimed at completion of the project. The area will be recontoured and revegetated as necessary to pre-construction conditions. No construction will occur in wetlands. Direct localized impacts will occur to stream channels at the water intake structures on Buckskin and Pat Hughes Creeks (for which Thompson Creek will seek a Nationwide Permit from the Corps of Engineers. The Thompson Creek pipeline will be routed either above or below existing culverts, depending on the required elevation of the pipe at that location.

The land application areas and settling basin locations are located outside of wetlands areas.

Woody Debris Recruitment:

Streamside vegetation along Thompson Creek and its tributaries consists of cottonwood, aspen, willow and alder. Aquatic surveys indicate 70 to 90 percent of streambanks are covered with either vegetation or cobble. Cutbanks up to 2 feet high occur in some places. Riparian vegetation on Buckskin Creek and Pat Hughes Creek consists primarily of healthy, dense woody vegetation with lush herbaceous species. Construction of the pipeline will disturb areas on both sides of the pipeline. Some low, streamside riparian vegetation, which could or does provide streamside shading, may be removed in conjunction with the construction but little to no riparian cover or canopy created by mature tree species will be removed from the streambank during construction. The area and volume of riparian vegetation removed will be minimal and insufficient to impact water temperature. Construction activity will be principally confined to the roadway or road right-of-way on the upslope side of the road.

- Disturbed areas will be re-contoured and shaped to promote runoff drainage as needed.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

- Seeding will be accomplished by broadcast seeding methods, occurring either in the late fall or early spring, depending on completion of the pipeline.
- Periodic inspection of the seeded areas will occur during routine road maintenance.

• Some low streamside vegetation will be removed along Buckskin, Pat Hughes, and Thompson Creeks by construction but no removal of riparian canopy created by mature trees will occur. The area and volume of riparian vegetation removed will not be sufficient to impact water temperature.

• Where necessary and appropriate, as at stream crossings or on disturbed banks, suitable riparian vegetation species will be replanted along the pipeline route.

• Water blocks consisting of compacted low-permeability materials, will be placed in the backfilled trench at culvert crossings along the pipeline right-of-way to prevent the trench from causing channel flooding or draining of the water table in the riparian areas along the right of way.

Water Quality

On Thompson Creek the USFS monitors aquatic habitat parameters, resident fish populations, percent fines with core sampling, water temperature, utilization levels, and water quality parameters including pH and conductivity. The TCM monitors aquatic populations and water quality including the following parameters: conductivity, pH, temperature, turbidity, total suspended solids, alkalinity, chloride, sulfate, hardness, iron, manganese, molybdenum, zinc, cadmium, copper, lead and stream discharge flows. Thompson Creek generally contains calcium-bicarbonate type water with a pH between 6.0 and 8.0. Copper, cadmium, lead, and zinc levels are at or below Idaho water quality standards.

Water quality data for Buckskin and Pat Hughes Creeks generally contains calcium-sulfate type water with pH values ranging from about 7.0 to 8.5. In general, copper, cadmium and lead have been at or near detection limits. Rerouting of the Buckskin sediment pond discharge and the Pat Hughes sediment pond discharge through the pipeline to the mill could potentially improve water quality conditions in Thompson Creek. This water quality improvement is because selenium, cadmium, zinc, and other regulated trace minerals in the sediment pond discharge will be sent to the mill as process water instead of being released to Thompson Creek.

- Prior to construction TCM will file an NOI for the EPA Construction General Storm Water Permit and has prepared a Storm Water Pollution Prevention Permit (SWPPP). A number of off-site sediment control measures have been implemented for roads within and accessing the TCM site.

DRAFT

REVIEW DRAFT

- The TCM Transportation Requirements Plan requires appropriate road maintenance and BMPs along access roads. Along Thompson Creek these requirements include monitoring, inspection and cleaning of culverts, silt fencing and straw bales and proper disposition of bladed material.
 - Construction traffic and soil disturbance increases the possibility of fine sediment delivery to Thompson Creek. To date, sediment management activities and BMPs implemented to date have controlled, and will continue to control, sediment delivery.
 - The Thompson Creek pipeline project SWPPP (Appendix 1) further supports management activities and BMPs in controlling sediment delivery during construction of the pipeline.
- Equipment storage, fueling, and maintenance area locations will meet guidelines for minimum distances from surface water. These staging areas will be subject to runoff and runoff BMP's to isolate stormwater runoff to prevent degradation of water quality resulting from these activities. The project will be designed to meet BLM requirements for full containment of fueling areas and separation of 100 feet or more from surface water or wetlands.

Water Temperature

Bull trout temperature criteria apply to all tributary waters located within the Thompson Creek drainage. Water temperature criteria allow for a 53.6 F daily average during June, July, and August for juvenile bull trout rearing and a 48 F daily average during September and October for bull trout spawning. Construction activities will not occur during rearing and spawning season and would not impact stream temperatures at any time.

Water Rights

Water rights are issued by IDWR for the mill. The TCM holds industrial water right permits for the use of water from the Salmon River, natural springs, Bruno Creek, and Mill Creek. Water Right 72-07193 provides for the use of 20.89 cfs or 1600 acre feet per year (AFY) of the Salmon River. Application for exchange of water proposes to divert up to 8.0 cfs from Buckskin Creek, 11.0 cfs from Pat Hughes Creek, and two unnamed springs in exchange for a portion of the Salmon River water right. This is a transfer of water right point of diversion for the pipeline. No new water right is required to implement the project. Water rights for the diverted springs will be transferred from existing rights through application for change of point to diversion

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT**Cumulative Effects**

Past human activities in the Thompson Creek drainage have included road construction, surface and underground mining and mineral processing, power line construction, water line construction, vehicle use, timber harvest, fire suppression, hiking, hunting, fishing, and other recreational uses. Compared to these past human activities, the temporary disturbance caused by the proposed water pipeline construction and operation is short term and minimal in magnitude.

Buckskin Creek, Pat Hughes Creek, and Thompson Creek will experience cumulative effects resulting from the project. The cumulative effects will be associated with ground disturbance, localized removal of riparian vegetation, and diversion of flows of Buckskin Creek and Pat Hughes Creek and the man-made springs into the pipeline that will reduce flow to Thompson Creek. These effects are not expected to be observable or measurable as a result of planned mitigation measures.

Interrelated and Interdependent Affects

It is likely that the project will result in interrelated and interdependent affects to vegetation from construction of the pipeline along Buckskin Creek. Diverting water from the springs feeding Buckskin will alter distribution of existing water potentially causing the surrounding vegetation to decline or die. This could be visible to the casual observer. The construction SWPPP provides for mitigation to vegetation impacts during the construction period and for restoration of applicable areas following completion of the project.

There is also the potential for the spread of noxious weeds along the Buckskin, Pat Hughes, and Thompson Creek corridors. BMPs are included in the construction SWPPP for controlling the spread of noxious weeds during construction of this project.

VIII. Project Monitoring

It is anticipated that no additional monitoring of conditions from constructing the pipeline will be necessary in Thompson Creek and Buckskin and Pat Hughes Creeks. Current monitoring programs already in-place should be sufficient given the timing of construction and the short duration of the project. The construction SWPPP will monitor BMPs for impacts from any storm related events and revise if necessary.

IX. Determination of Affects and Rationale

Based on the above assessment and specific project mitigations, the following determinations have been made for this project.

- Not Likely to Adversely Affect (NLAA) for Snake River spring/summer Chinook salmon or their designated critical habitat or essential fish habitat due to timing of project, location of currently occupied habitat, and BMPs to reduce instream fine

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

sediment. There could be some affects from alteration in streamflow that may or may not be measurable.

- NLAA for Snake River steelhead trout and their proposed critical habitat for same reasons described above.

- NLAA for Columbia River Basin bull trout and their proposed critical habitat for same reasons described above.

- May affect individuals, but is not expected to result in a trend toward federal listing for Westslope cutthroat trout. BMPs used to protect federally listed salmonids will also reduce the potential to affect Westslope cutthroat trout in Thompson Creek.

Proposed critical habitat for Snake River steelhead trout is limited to occupied or historic habitat only. Buckskin Creek and Pat Hughes Creek should not be included as proposed critical habitat for Snake River steelhead trout because they are not currently occupied by this species nor are they recognized as historic habitat for this species.

X. Essential Fish Habitat

NLAA for Essential Fish Habitat features as described in Magnuson-Stevens Act (basically same as critical habitat features). This conclusion is the for the same reasons as the Chinook determination above.

XI. Compliance with PACFISH Riparian Management Objectives

This project is in compliance with the Riparian Management Objectives (RMOs) defined in PACFISH. None of the proposed activities will prevent the attainment of the RMOs for water temperature, streambank stability, large woody debris, width to depth ratio, and pool frequency.

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

XII. References

- Evaluation of Proposed New Point Source Discharges to a Special Resource Water and Mixing Zone Determinations: Thompson Creek Mine facility, Upper Salmon River Subbasin, Idaho;* IDEQ, December 2000
- Draft Recovery Plan, Bull Trout, Chapter 17, Salmon River Recovery Unit;* USFWS, October 2002
- Memo Regarding Steelhead Stocking in Upper Salmon River Basin in the Vicinity of Thompson Creek;* Chadwick Consulting, November 2003
- 2004 Annual Sediment Report (Fall 2003 Conditions), Thompson and Squaw Creeks, Thompson Creek Mining Company;* Stantec Consulting Inc., January 2004
- Thompson Creek Wetland Delineation Report,* MWH, May 2004
- Roads Analysis Report, Salmon-Challis National Forest, FS ID Team,* January 2003
- Environmental Assessment for the Proposed Amendments to the Management Indicator Species List for the Salmon and Challis Land and Resource Management Plans,* FS, February 2004
- USDA 1999. Biological Assessment for Bull Trout in the Lower Canyon (Salmon River) East Fork to Peach Creek Section 7 Watershed. Prepared by the U.S. Forest Service, Salmon and Challis National Forest, Yankee Fork Ranger District and the Upper Columbia Salmon - Clearwater District, Bureau of Land Management, Challis Field Office.*
- USDA 1999. Biological Assessment for Snake River Steelhead in the Lower Canyon (Salmon River) East Fork to Peach Creek Section 7 Watershed. Prepared by the U.S. Forest Service, Salmon and Challis National Forest, Yankee Fork Ranger District and the Upper Columbia Salmon - Clearwater District, Bureau of Land Management Challis Field Office.*
- Inland Native Fish Strategy. 1995. Interim Strategies for Managing Fish Producing Watersheds in Eastern Oregon and Washington, Idaho and Portions of California (INFISH). Environmental Assessment. Washington D.C.*
- Interim Strategies for Managing Anadromous Fish Producing Watersheds on Federal Lands in Eastern Oregon and Washington, Idaho and Portions of California (PACFISH). Environmental Assessment. Washington D.C.*

DRAFT

Biological Assessment
Thompson Creek Underground Pipeline Project
06/24/04

REVIEW DRAFT

List of Preparers

(Preparer)		Date	(Reviewer)	Date
Jamie Sturgess	Stantec	July 22, 2004		
Jody Noble	Stantec	July 22, 2004		
Steven Powers	Stantec	July 22, 2004		
			(Reviewer)	Date
			(Reviewer)	Date
			(Reviewer)	Date