0012

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

November 12, 1997

Regulatory Branch (199450397)

Allen Childs
Cyprus Plateau Mining Corporation
P.O. Box PMC
Price, Utah 84501

Copy Daron, Joe, &
ACT/007/038 #2 Pete
Hess

Dear Mr. Childs:

This letter is in regard to your company's need for compliance with the terms of our permit no. 199450397, issued to allow the relocation of a section of Willow Creek near Helper in Carbon County, Utah.

Special Condition 12 of our permit specified that all monitoring reports prepared for the Utah Division of Oil, Gas and Mining (DOGM) in compliance with its permit ACT/007/038 that were related to areas occupied by the new channels and culverts were to be submitted to the Corps of Engineers at the same time that these reports were submitted to DOGM. We have not received the report for 1996 activities.

In addition, it appears from our site inspections this year that the efforts to vegetate the banks of Willow Creek have not been successful. Very few of the streambank plantings have survived. Since we are now in the season during which dormant cuttings can be planted, we assume that your plans for this area include replacement cuttings during the next few months.

Please forward to this office by December 1, 1997, a copy of the 1996 monitoring report together with a description of the measures you intend to take to achieve revegetation success for this project.

If you have any questions, please contact Ms. Michele Waltz at the Utah Regulatory Office, 1403 South 600 West, Suite A, Bountiful, Utah 84010, telephone (801) 295-8380, extension 16.

Sincerely,

Brooks Carter
Chief, Intermountain
Regulatory Section

Copies furnished:

Mr. Ben Grimes, Cyprus Plateau Mining Corporation, P.O. Box PMC, Price, Utah 84501
Mr. Steven Johnson, Utah Division of Natural Resources, Division of Oil, Gas and Mining, 1594 West North Temple, Suite 1210, Box 145801, Salt Lake City, Utah 84114-5801
Mr. Greg Mladenka, Utah Division of Water Rights, 1594 West North Temple, Suite 222, P.O. Box 146300, Salt Lake City, Utah 84114-6300
Utah Division of Wildlife Resources, Southeastern Region Office, 455 West Railroad Avenue, Price, Utah 84501

CYPRUS PLATEAU MINING CORPORATION
A Cyprus Amax Company

Cyprus Plateau Mining Corporation
Post Office Drawer PMC
Price, Utah 84501
(801) 637-2875

November 18, 1997

Mr Brooks Carter
Chief, Intermountain Regulatory Section
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Dear Mr. Brooks,

RE: YOUR LETTER DATED NOVEMBER 12, 1997 - PERMIT 199450397

Special Condition 12 was addressed in a letter report to Ms. Michelle Waltz dated April 29, 1997. The report attached to that letter is a copy of Appendix E of the 1996 annual report to the Utah Division of Oil, Gas and Mining. The Division of Oil, Gas and Mining was satisfied with the report. A copy of the report is attached for your reference.

As stated in the report, most of the seeding was done in the fall of 1996 and during 1997, therefore monitoring was not possible in 1996. The only plantings that were done in 1996 that could be evlauated were the pole plantings. As discussed on several occasions with Ms. Waltz the pole plantings are hard to evaluate because they sometimes seem dead but one or two years later leaf out and start to grow.

We have made a review of the vegetation and plantings during the fall of 1997 according to the Division of Oil, Gas and Mining guidelines and in coordination with Mr. Paul Baker fo the Division. A report will be included in the 1997 monitoring report to the Division. This report is due to the Division by the end of April, 1998.

Our preliminary evaluation of the plantings indicates some of the plants in fact did not survive. We will contact you when the report is finalized in the next couple of months and will determine with your assistance what is an acceptable number of plants. We have always made it a practice to plant seedlings in the spring since better survival is achieved in the spring. Our goal is to plant additional plantings during the spring of 1998 to replace those lost.

Our preliminary evaluation of seeding indicates that there has been good success with seed germination and survival. It appears in a cursory visual inspection of the stream channel area that annual weedy plants predominate. This is true if you only consider biomass, however, upon closer inspection, there is a very thick layer of the species planted by seed. Our experience has been that annual weedy species do very well in recently disturbed ground but, after the second growing season the weedy species decrease significantly, and the desirable species take over.

Survival of seedlings and pole plantings is less than hoped for, but additional plantings will over time rectify that problem.

We would be glad to discuss this matter with you if you have further questions. Please contact me at (435) 472-4733.

Sincerely,

Ben Grimes
Sr. Staff Project Engineer

Attachement

C:
Ms. Michelle Waltz -COE
Ms Pamela Grubaugh-Littig - DOGM
Mr. Greg Mladenka - DWR
DWR - Southeastern Region

File: WCENV 1.3.1
Chron: BG971103

CYPRUS AMAX
Plateau Mining

Cyprus Plateau Mining Corporation
P.O. Drawer PMC
Price, Utah 84501
(801) 637-2875
Fax: (801) 637-2247

April 29, 1997

Ms. Michelle Waltz
US Army Corps of Engineers
Utah Regulatory Office
1403 South 600 West, Suite A
Bountiful, Utah 84010

Dear Ms. Waltz,

RE: ANNUAL REPORT - 1996 - PERMIT NO. 199450397

Enclosed is a copy of the information required by special conditions of the Willow Creek Mine permit No. 199450397.

Because seeding and planting was conducted in late 1996, vegetation monitoring was not possible. Monitoring in 1997 will document vegetation success and will be reported during the 1997 reporting schedule to DOGM and to the Corps.

If you have any questions don't hesitate to call.

Respectfully,

Ben Grimes
Sr. Staff Project Engineer

File: 1.3.1
Chron: BG970418

Response to Corps of Engineers Permit Conditions
Permit No. 199450397
Cyprus Plateau Mining Corporation

April 28, 1997

This report responds to Special Conditions 7 and 12 of the referenced permit.

Condition No. 7:

The attached graph titled Willow Creek Weir Flow presents the monitoring data from two weirs installed in Willow Creek, one above the stream relocations sections called the "Upper Weir", and one below the stream relocation called the "Lower Weir".

The weir design was intended to measure low flows, the agencies did not want large weirs that might cause problems with channel flow and fish movement. The maximum flow the weirs can measure is 12.53 cfs. The weirs are rectangular with a 3 foot crest and a low flow V notch 0.5 feet deep for very low flows. It was felt that flow differences could only be measured accurately at relatively low flows since high flows would be difficult to measure.

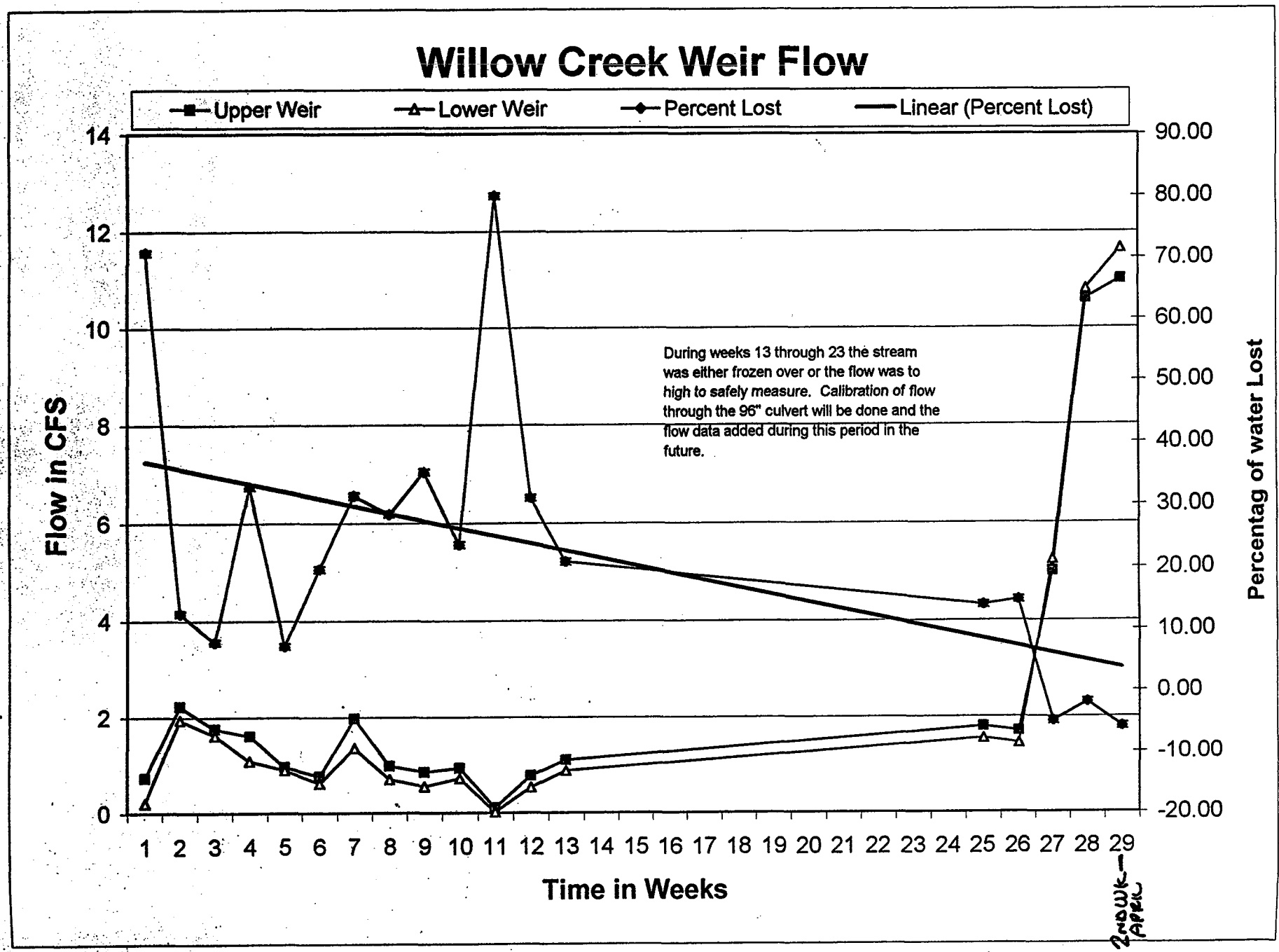
As can be seen on the attached graph, the percentage of water loss from the upper weir to the lower weir appears to be declining. If this is in fact happening, it would indicate that the riprap channel lining is filling in with silt allowing less water loss to the ground. Continued monitoring will give additional data for evaluation. It must be recognized though that even in the natural stream some water loss is often possible, and the loss between the weirs may never be zero.

Evaluation of siltation in the riprap void spaces will be made when the spring runoff flows have dropped to where the riprap is visible. As of this date, the flow has been quite high (approximately 2 to 4 feet deep for the past few weeks. This flow has been very difficult to measure because the water is so deep and swift it is to dangerous to negotiate for measuring with a current meter. We are working on developing a method of flow estimation based on the flow depth in the 96 inch diameter culvert. We have been collecting flow depths in the culvert whenever the flow is higher that the maximum weir depth. We will attempt to collect velocity data using a current meter to verify the culvert flow. If an estimation method is developed the culvert flow depths can then be used to provide flows for the period of snow melt.

Condition No. 12:

Since seeding, pole plantings, seedling planting, and willow cutting plantings occurred in the fall of 1996 and some this spring, no vegetation monitoring has been conducted. During 1997, vegetation monitoring will be conducted and reported during the 1997 reporting period.

The attached letter report from SWCA Inc. Environmental Consultants addresses the function and stability of the channels as required.



Week 1 was the 2nd week of September, 1996.

SWCA INC. ENVIRONMENTAL CONSULTANTS
56 West 400 South, Suite 201 • Salt Lake City, Utah 84101
(801) 322-4307 • FAX (801) 322-4308

January 16, 1997

Mr. Ben Grimes
Cyprus Plateau Mining Corporation
P.O. Drawer PMC
Price, UT 84501

Re: Special Condition No. 12 on U.S. Army Corps of Engineers Permit No. 199450397

Dear Mr. Grimes:

This letter serves as an assessment of the function and stability of the relocated Willow Creek stream channel, as required by the Permit No. 199450397 (referenced above).

Background

SWCA personnel (Mark Raming and I) have been involved with the Willow Creek relocation since just before construction began. We reviewed the relocated stream channel design prior to construction (including soliciting review and input from Dr. John C. Schmidt, Logan, Utah) (SWCA 1996). We were also present during construction of the new channel and supervised the creation and incorporation of several types of habitat features into the new channel. One of the main design features we used repeatedly was a rock dam constructed from a row of 4'-7' diameter boulders imbedded perpendicularly into the riprap layer, causing water to fill a pool constructed upstream from the dam, spill over the dam's top, and plunge downstream (see photo #1). Approximately 50 of these rock dams were installed in the relocated stretches of Wilow Creek. The plunges associated with each boulder dam were designed to be <12" in height to allow for fish passage. Other design features were individually placed boulders and rock overhangs, to allow for shade and habitat diversity (see photo #2).

Assessment

The relocated Willow Creek has the structure to serve as a stable and functional stream channel. The shape of the stream channel and the continuous layer of riprap should successfully convey flow and prevent the stream from eroding into the streambank. Once the vegetation is successfully established, the topsoil covering the riprapped streambanks will be stabilized (complete establishment of vegetative groundcover on this topsoil was not achieved in 1996 due to project delays; this may result in some sediment movement into the stream channel in spring of 1997 which would not be expected in subsequent years when vegetative cover is more complete).

Interspersed with the riprap material used to create the stream channel were 2"- to 6"-diameter rocks. These smaller rocks were worked into the riprap material to fill void spaces and slow the passage of water, allowing for stream sediment load to settle out and fill in remaining void spaces. Going into construction, we were unsure how long it would take for the void spaces to fill in with sediments. As a precautionary measure, special condition #5 of the Corp's permit was

implemented. This called for "a 12-inch-thick layer of 1" by 4"-size clean gravel beneath all channel riprap within the riparian zone to help prevent any piping of the soils from underneath the riprap."

The summer thunderstorms that we hoped would deliver and deposit the necessary sediments never occurred. Thus, much of the discharge was traveling below the surface of the riprap. Discharge decreased and then ceased as summer progressed. In addition, there was concern that streamflow was being lost on the lower stretch of the relocated channel where a 36' deep pit was excavated and refilled in late spring 1996 to remove soil contaminated with diesel fuel. After the regulating agencies concurred with Cyprus Plateau, approximately 100 cubic yards of sediment, consisting partially of bentonite (a clay which expands in volume when saturated with water), were deposited into the lower stretch of Willow Creek for two reasons: (1) to hasten the filling of void spaces in the riprap and (2) to plug macropores within the excavated and refilled area which were allowing for the subterranean diversion of stream flow. In addition, more boulders and riprap material were added in mid-Sepember to the lower third of the lower relocated section of Willow Creek in order to improve the overall shape of the channel.

The precipitation finally began to fall in mid-September and continued periodically throughout autumn. The increased flows most likely were depositing more sediment to void spaces in the relocated channel, because once the storms began, streamflow was increasingly being conveyed above the riprap. Measurements made at box weirs installed in September 1996 above and below the relocated stretch of stream show that before the autumn storms began in mid-September, only 30% of discharge passing the upper weir also passed the lower weir (Graph 1). After the storms began, that percentage was boosted up to between 65% and 90%. However, some discharge is still being lost in the relocated stretch. As more storm events pass, we believe the relocated channel will continue to seal itself.

A high flow event, estimated to be >35 cfs, occurred in late November. This discharge estimate was made from the high water mark at the box weir located above the relocated channel stretches. While I was not present during the event, inspection of the stream channel on December 13 showed no noticeable movement of stream boulders or structural alteration of any riprap.

The rock dams designed to form pools and plunges appear to be functioning properly. Before the autumn precipitation began, flow was passing around (as well as over) the dams through voids in the riprap and smaller rock. As autumn progressed, however, more water began to spill over the rock dams, indicating sealing of the pools and dams.

Areas of Concern

The bottom of the pool located just below the newly installed 96" diameter culvert is partially sealed with cement to ensure that the pool's water level is higher than the bottom of the culvert's outlet, thus allowing fish to enter the culvert. Below this pool is a "riffle" section (approximately 30 feet in length) which is steeper than any other stretch of the relocated channel. While some flow this autumn was spilling from the pool to the riffle section, some flow is also piping from

the bottom, unsealed portion of this pool to just below the riffle stretch. An effort should be made to fully cement the bottom of this pool to prevent this piping.

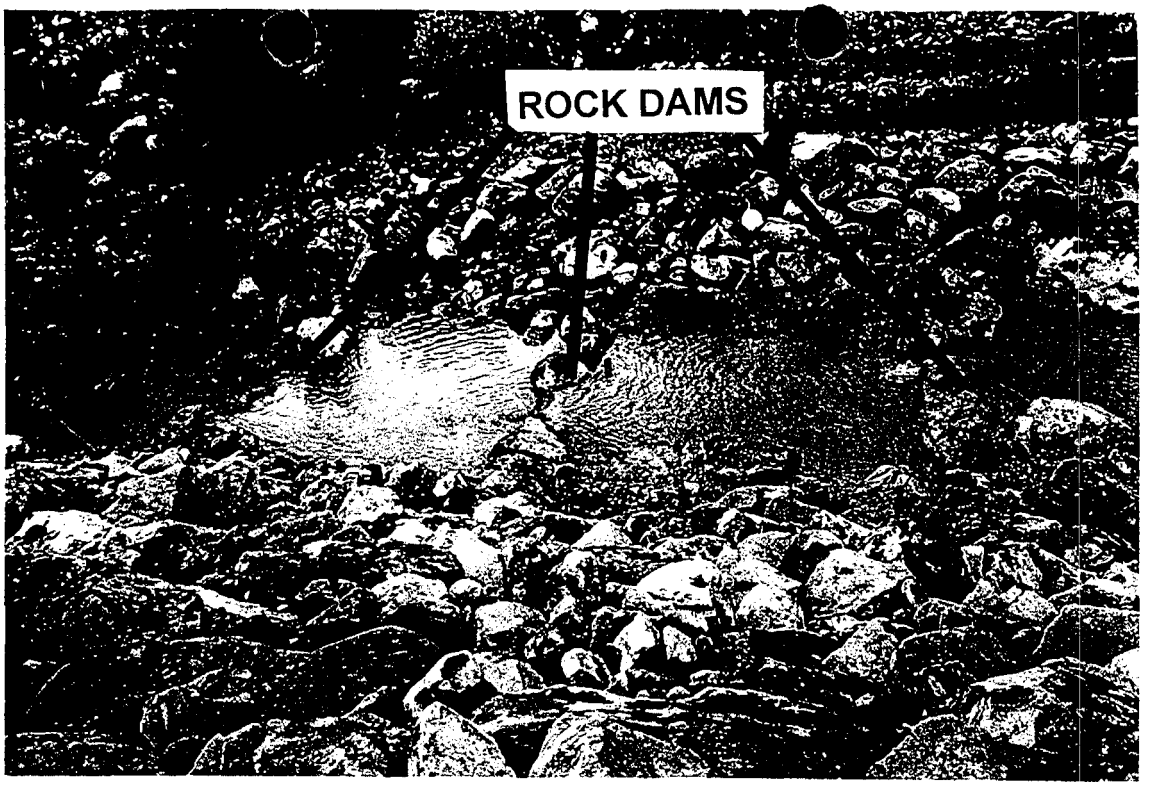
Conclusion

The relocated sections of Willow Creek are progressing toward providing its designed functionality. The constructed pools will provide more fish resting and feeding habitat than existed in the original sections of Willow Creek. Continued deposition of sediment in riprap void spaces and progress in revegetation efforts should allow for the on-going improvement and development of a healthy stream channel and riparian community. Continued monitoring of vegetation growth and discharge, along with inspection of the functionality rock dams, pools, and other habitat features, will document the progress of the Willow Creek relocation project.

Sincerely,

Howard Gross

Howard Gross
Watershed Ecologist
SWCA Inc., Environmental Consultants



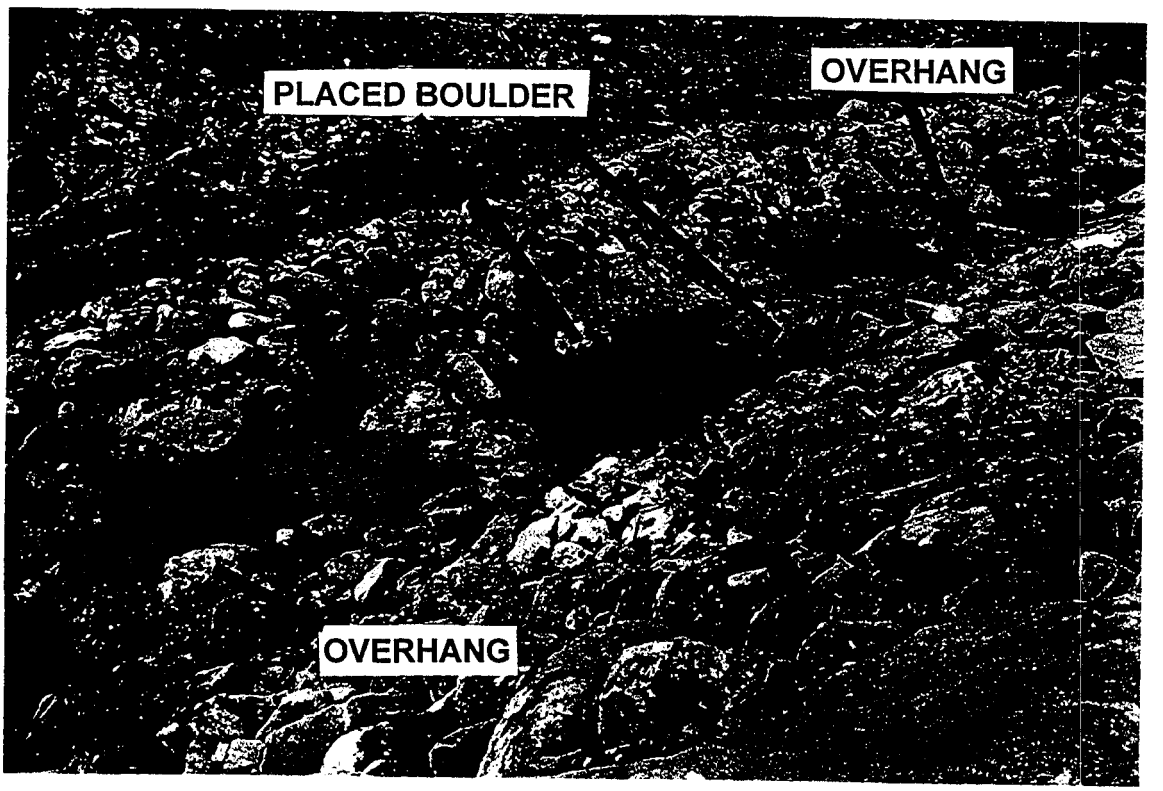
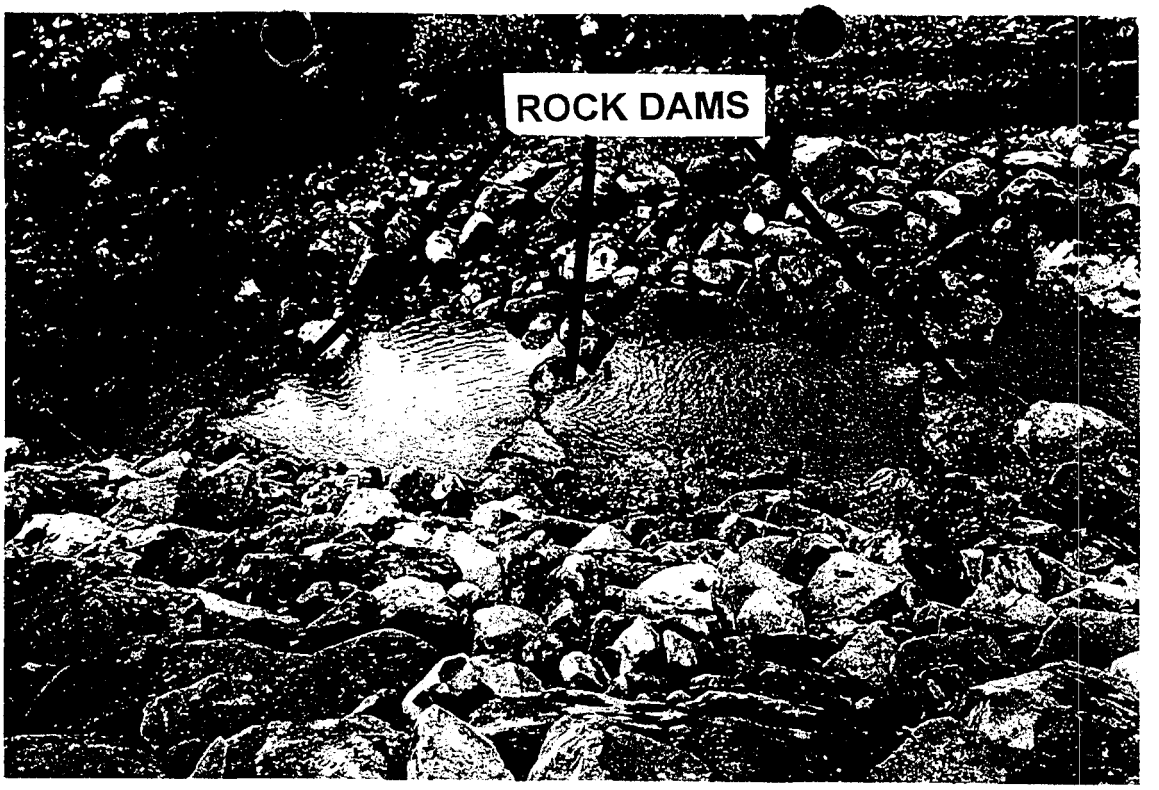


Photo #1 (top) and #2 (bottom). Designed habitat features in upper stretch of relocated Willow Creek, July 1996. Rock dams (top) and rock overhangs and individually placed boulders (bottom) are noted.



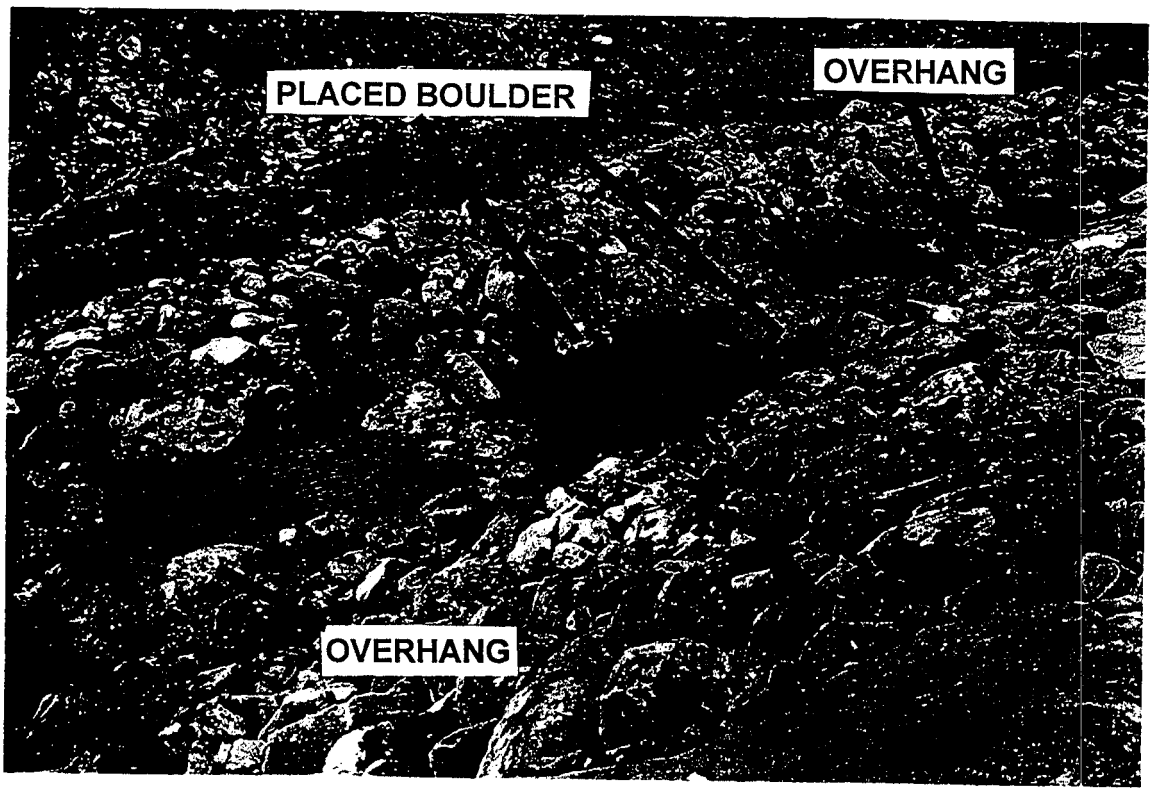


Photo #1 (top) and #2 (bottom). Designed habitat features in upper stretch of relocated Willow Creek, July 1996. Rock dams (top) and rock overhangs and individually placed boulders (bottom) are noted.

Graph 1. Flow at Weirs Above and Below Willow Creek Stream Relocation