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R645-301-300 (BIOLOGY)

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APPENDIX 3-1
RIPARIAN VEGETATION DISCUSSION

RIPARIAN VEGETATION DISCUSSION

GENERAL DISCUSSION

The SCA Permit Area contains a variety of vegetation types. The majority of the site is vegetated with Pinyon-Juniper and sagebrush grass and a smaller portion is vegetated with Atriplex Grass. There is one area in particular which is densely vegetated with both wetland and riparian vegetation. This area is located at the base of the coarse refuse lifts towards the northwest corner of the Permit boundary and extends to the western boundary of the SCA Permit Area. This specific location is referred to as the "seep".

The seep has been a source of concern throughout the life of both the Sunnyside Mine and the SCA operations. As a result, a sampling program was implemented on June 30, 1993 to monitor specific water quality parameters. The sampling regime is included as Appendix 7-8 of the PAP.

Treatment methods have been researched in an effort to reduce iron, manganese and Total Settleable Solids (TSS) levels. Various procedures have been attempted and presented to the various regulatory agencies involved. At this time, an agreeable treatment method has not been determined, although, the existing riparian vegetation within the seep area has proven to be extremely beneficial in improving the water quality downstream.

A site visit was conducted on July 16, 1993 by Alane Boyd and Jessica Smith, as representatives of SCA, to identify the vegetation located within the seep area. It should be noted that although it was only required that SCA submit a discussion of the riparian vegetation types, this report includes both wetland and riparian species due to their prevalence and important functions within the area.

Upon studying the various plant species, it was determined that the majority of the species within the seep itself were broad-leaf cattails and salt cedar, which are both hydrophytic vegetation types. The riparian vegetation found were mainly woody species, whereas the wetland vegetation types contained a mixture of trees, forbs and grasses. A comprehensive list of the wetland and riparian species identified within the seep area is included below.

- 1.) *Typha latifolia*/Broad-leaf cattail
- 2.) *Tamarix ramosissima*/Saltcedar
- 3.) *Elaeagnus angustifolia*/Russian Olive
- 4.) *Polypogon monspeliensis*/Annual rabbit-foot grass
- 5.) *Amelanchier alnifolia*/Serviceberry
- 6.) *Iva xanthifolia*/ Coarse Sumpweed
- 7.) *Muhlenbergia asperifolia*/Alkali muhly
- 8.) *Elymus cinereus*/Basin wildrye

In order to determine the overall characteristics of the site, a species distribution was determined based on area cover. This distribution is discussed below.

- a.) Beginning at the base of the coarse refuse lifts and extending west to the existing D&RGW RR, approximately 60% of the area is vegetated with saltcedar, 37% with

broad-leaf cattails, and the remaining 3% with a variety of grasses including Annual rabbit-foot grass and Alkali muhly.

- b.) Beginning at the D&RGW RR and extending to the western boundary of the SCA Permit Area, approximately 65% of the area is vegetated with Broad-leaf cattails, 30% with Saltcedar and the remaining 5% with a variety of riparian and wetland species including Annual rabbit-foot grass, Alkali muhly, Serviceberry, Russian Olive, and Coarse Sumpweed.

Each plant species has been identified according to its indicator species and various physical characteristics. Table One below outlines each indicator status category and corresponding probability of occurrence in a wetland. The plant indicators are included for general information only. For the purposes of this report, they were used only as a guideline in determining probable transitions between soil and groundwater conditions.

TABLE ONE

Plant Indicator Status Categories	Probability of Occurrence in Wetlands
Upland - UPL	< 1 percent
Facultative Upland - FACU (+/-)	1-33 percent
Facultative - FAC (+/-)	34-66 percent
Facultative Wetland - FACW (+/-)	67-99 percent
Obligate - OBL	> 99 percent

The sections below includes a detailed discussion of each vegetation type. Each discussion includes its species indicator, habitat and a description of its physical characteristics.

Typha latifolia/Broad-leaf cattail (OBL)

The Broad-leaf cattail is a coarse perennial herb with stout, branching rhizomes. Its stems are upright and smooth and grow 1 to 3 meters tall. The leaves are always at least 1/2 inch wide and there are 12-16 leaves per stem. This is a distinguishing characteristic from the Narrow-leaf cattail which has only 6-9 leaves per stem. The Broad-leaf cattail has both the male and female flowers borne separately in spikes on the same plant with the male spike always directly above the female spike. The male spike is pale brown and falls away after the pollen is shed. The female spike is dark brown in color and grows up to 1-1/2 inches thick and 10 inches long.

The Broad-leaf cattail is an obligate (OBL) species in Region 8. It is found in and along slow moving streams, around lakes and ponds, and in most Utah counties between 4200 and 6900 feet elevation.

Tamarix ramosissima/Saltcedar (FACW)

The Tamarix family is a family of shrubs or small to moderate trees that have alternating, scale-like leaves. The flowers are mostly perfect and are borne in spikelike racemes arranged in panicles.

Specifically, the Tamarix ramosissima (saltcedar) is categorized as a shrub or small tree that grows up to 20 feet tall. It has an "airy" appearance and its irregular appearance causes it to stand out from the typical shrubs and small trees that grow in riparian areas. The stems of the saltcedar stand erect and are reddish-brown. The leaves alternate along the stem and are scale-like. The leaves are blue-green in color and are lanceolate to ovate-lanceolate.

The saltcedar was introduced from Eurasia and has become a somewhat common species along streams, canals, and reservoirs through the State. It is most commonly found between the elevations of 2800 and 5600 feet in most Utah counties. The indicator for the saltcedar is Facultative Wetland (FACW).

Elaeagnus angustifolia/Russian Olive (FAC)

The Elaeagnus genus consists of shrubs or trees with ascending, alternate, branches. The leaves are also alternate and the flowers are axillary and can be either perfect or polygamous. Specifically, the angustifolia species has branchlets and leaves with silvery peltate scales. They grow rapidly to small to medium stature of approximately 5-12 m (16-40 ft) in height. Their trunks are 1-5 dm (0.30 -1.7 ft) thick and the stems are often armed with coarse thorns. The leaves are characterized by their silvery appearance and lance-oblong to linear-oblong or elliptic shape. They have also been found to be bi-colored. The flowers are usually 8-12 mm (1/3-1/2 in.) and are described as stellate-hairy. The fruits are olive-like, as the name implies, and are 1-2 cm (0.4-0.8 in.) long.

The Russian Olive is a very distinct woody species that was introduced from Europe and is found in all Utah counties. The plant grows along drainages in moist meadows over vast areas of the state. Its indicator species in Region 8 is Facultative (FAC).

Polypogon monspeliensis/Annual Rabbit-foot grass (FACW+)

Rabbit-foot grass is an introduced annual species found in most Utah counties between 4000 to 7000 ft elevation. Its appearance is noted by its fluffy-like flowers found at the top of the stem. The flowers are densely arranged and resemble a spike. The glumes of each flower are about 1/10 inch long. The stems can be solitary or found in clumps and grow up to 2 feet tall. The leaves are narrow and elongated and are ridged along the upper surface. The leaves grow up to 8 inches long whereas the ligules grow up to 4-10 mm long.

Rabbit-foot grass is found in wet soil along ditches, marshes, along streams and rivers, and around lakes and ponds. In Region 8, its indicator is Facultative Wetland Plus (FACW+).

Amelanchier alnifolia/Serviceberry

The Serviceberry is found on streamsides, meadows, and mountain slopes at 1500 m (4950 ft) to 2900 m (9570 ft) and in sagebrush, mountain brush, aspen, and mixed conifer communities at 1220 m (4025 ft) to 2900 m (9570 ft) in all Utah counties. The Serviceberry is considered a shrub or small tree which grows anywhere from 2 to 5 m tall.

The leaves are oval to oblong and are mainly 20-50 mm long and 15-40 mm broad. They can be either glabrous or hairy on one or both sides and are serrate near the apex. The flowers grow in short racemes. The petals are usually 9-15 mm long and 3.3 to 5.8 mm wide.

The indicator for the *Amelanchier alnifolia* is Facultative Upland Minus (FACU-). The serviceberry found within the SCA Permit boundary is located on the northern bank of the seep, west of the D&RGW RR and is approximately 8 feet (2.4 m) tall.

Iva xanthifolia/Coarse Sumpweed (Marsh Elder) (FAC+)

Iva Xanthifolia is a coarse perennial herb that grows 4-25 dm (1.25-8.25 ft.) tall. The stems are either simple or branched and are essentially glabrous below and glandular above. The leaves are opposite with blades 4-20 cm (1.5-8 in.) long and 4-20 cm wide. They are broadly ovate to lance-ovate, serrate, and sometimes lobed.

The SCA Permit Area, specifically in the seep area, contains a sparse population of the marsh elder. The marsh elder is considered a ruderal weed found in disturbed soils at 1370 m (4520 ft) to 2290 m (7560 ft). It is found in a variety of Utah counties, Washington, Arizona and New Mexico, and widely distributed elsewhere. In Region 8, the species indicator is Facultative Plus (FAC+).

Muhlenbergia asperifolia/Alkali muhly (Scratchgrass) (FACW+)

The *Muhlenbergia* genus is distinguished by its stalked, 1-flowered spikelets with a 3-nerved lemma. Specifically, the *asperifolia* species is recognized by its open panicals and awnless glumes.

Scratchgrass is a perennial native grass that grows up to 18 inches tall. The stems are smooth and somewhat flattened. The leaves are narrow, elongated, and usually rough to the touch, whereas the sheaths are glabrous. The ligules are 0.2-1 mm long and truncated.

The species indicator is Facultative Wetland Plus (FACW+). It is found in alkaline or saline sites, damp meadows, around ponds, along streams, disturbed areas, in salt desert shrub, sagebrush, and pinyon-juniper communities at 1000 m (3300 ft) to 2130 m (7030 ft) in most Utah counties.

Elymus cinereus/Basin wildrye (NI)

Basin Wildrye is a grass that forms large clumps and usually does not produce rhizomes. The glumes are awn-like and not broadened above the base. There are 3-6 spikelets at each node in the inflorescence.

Elymus Cinereus grows along streams, in meadows, along roads, edge of woods, and sagebrush areas. The stems grow up to 6 ft. tall. The stems are mainly unbranched and hollow, but have been identified to be either smooth or rough-hairy. The leaves are elongated, 1/4-3/4 in. wide, and hairy. The legumes grow up to 1/3" long and are membranaceous.

In general, this grass may be browsed by livestock. It is a good soil stabilizer and is used in new roadcuts. Black ergot, a fungus, is often present in the spikelets and can prove harmful to livestock.

The regional indicator for this species is "No Indicator" (NI). This means that there was insufficient information available to determine an indicator status. This grass is found in a large variety of areas from moist ultimately dry sites to pinyon-juniper, sagebrush and mountainbrush communities at 790 m (2600 ft.) to 2900 m (9570 ft.) in most Utah counties.

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