

Appendix 37.A

Pinabete Permit
Noxious Weed Management Plan

PINABETE PERMIT

NOXIOUS WEED MANAGEMENT PLAN

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1.0 INTRODUCTION

Invasive weeds pose a serious threat to many native plants in New Mexico. They specialize in colonizing highly disturbed ground. They are able to establish quickly and grow faster on disturbed areas than other plants.

As a surface coal mining operation, ~~BHP Navajo Coal~~ Navajo Transitional Energy Company (BNCCNTEC) has numerous acres of disturbed land. Land disturbances associated with mining can provide a habitat conducive to invasion and spread of noxious weeds. A weed management plan is needed to assist with BNCCNTEC's revegetation plan to establish diverse, stable, and self-sustaining vegetation that will satisfy the following criteria:

- 1) Adequate cover capable of stabilizing the soil surface from erosion,
- 2) Adequate forage to sustain the post-mining land uses (i.e., livestock grazing and wildlife habitat), and
- 3) Suitable species composition for enhancement of wildlife forage and cover.

The Navajo Nation is in the process of developing a Noxious Weed Management Plan. BNCCNTEC may integrate the Navajo Nation's Noxious Weed Management Plan into the Pinabete Permit application package when the Navajo Nation's plan is completed and accepted.

2.0 INVENTORY OF NOXIOUS WEED SPECIES

The areas of concern for noxious weeds on the Pinabete Permit area (permit area) are on the disturbed and revegetated plots and along constructed waterways or impoundments. BNCCNTEC will monitor revegetation plots undergoing irrigation for noxious weeds, however, we will not address the noxious weeds unless the weeds consistently persist after irrigation has ceased. These irrigated plots commonly have a high initial density of noxious weeds (which are in the form of annuals). However, the amount is often reduced when the area is no longer irrigated.

There are five weed species that are known to be present in the permit area (Table 1). Three of the weeds listed are considered noxious weeds.

Table 1. Weed Species Found in the Pinabete Permit Area.

Scientific name	Common name	New Mexico class	Comments
<i>Halogeton glomeratus</i>	Halogeton	B	Noxious
<i>Salsola tragus</i>	Prickly Russian thistle	Not designated	Not noxious
<i>Tamarix spp.</i>	Saltcedar	C	Noxious
<i>Kochia scoparia</i>	Kochia	Not designated	Not noxious

Bromus tectorum

Cheatgrass

C

Noxious

3.0 OBJECTIVES

One of the reclamation objectives stated in the permit is to “Establish on all affected areas a diverse, effective, and self-sustaining vegetation cover of the same seasonal variety as the native vegetation” (Section 30 Post-Reclamation Land Use). In addition, [BNCNTEC](#)’s Health, Safety, Environmental, and Community (HSEC) policy strives for long-lasting benefits to the local environment from mining operations. Noxious weeds must be addressed to adhere to this internal policy.

The objectives of [BNCNTEC](#)’s weed management plan are prevention, early detection, and control of noxious weeds to assist in achieving successful reclamation.

3.1 Prevention

The best weed management action is to prevent noxious weeds from becoming established in the first place. Preventing weeds from invading a site is the most effective and least costly method for control.

Reclamation activities provide a venue for the introduction of noxious weeds. The introduction of noxious weeds can be reduced by purchasing seeds and mulch from reputable dealers. Routine inspections of seeds and mulch, and familiarization with the dealers that provide them will be conducted to ensure no new weed seeds or vegetative parts enter the site through a contaminated seed source in seed mix and mulch.

Areas will be seeded using native species or carefully chosen, non-invasive introduced species as soon as possible after mining has ceased. Quickly establishing a good stand of desirable vegetation will minimize the opportunity for noxious weed establishment.

3.2 Detection

Detection of new infestations on the mine site is crucial for controlling noxious weeds. The [BNCNTEC](#) environmental department will remain up-to-date on the noxious weeds present on the mine site and those that have the potential to invade from surrounding areas. [BNCNTEC](#) environmental specialists will perform periodic inspections of the reclamation areas to detect and identify isolated infestations of noxious weeds. Detecting the isolated infestations of noxious weeds is a high priority to minimize their potential spread and colonization of reclamation areas.

3.3 Control

Control of noxious weeds on the permit area primarily consists of informally monitoring the disturbed and reclaimed areas, via regulatory inspections, irrigation pipeline checks, and general field inspections by

[BNCNTEC](#) environmental specialists. Infestations of noxious weeds will be addressed according to suitable control measures for each individual species.

3.3.1 Halogeton

Halogeton is an annual forb introduced from Russia. It is toxic to grazing animals, especially sheep. It is adapted to alkaline soils and semiarid environments. Halogeton is not extremely competitive with other plants, because it does not grow a large root system early in the growing season. When an infestation occurs, it makes the area less favorable for revegetation with other species. The abundance of halogeton is dependent upon year-to-year precipitation. Halogeton produces both brown and black seeds. The brown seeds are controlled by long photoperiods, have no dormancy, and are viable for one year. The black seeds are produced during short photoperiods, have dormancy, and can survive buried up to 10 years.

A concern for halogeton on the permit area could be on older reclaimed plots where irrigation has ceased and halogeton continues to persist. The control plan for halogeton is to mechanically or chemically treat an infested area. Infestations will be determined by cover, which will be calculated by randomly placing ten 50-meter point intercept transects (if size allows) in areas where halogeton is present. If the average cover of halogeton in the reclaimed area is greater than the average halogeton cover across the [BNCNTEC](#) reference areas in the same year, the area will be deemed infested. These areas will be treated either mechanically (e.g. by hand pulling or hoeing) or chemically as appropriate.

3.3.2 Saltcedar

Saltcedar was introduced from Europe and Asia. It is commonly found where water is present such as irrigation canals, springs, seeps, lakes, playas, arroyos, and dirt stock tanks. Saltcedar's root system is dominated by a root crown that extends about 12 to 18 inches below the soil surface. Saltcedar species are considered to be a "facultative phreatophyte" which means they can develop an extensive taproot to access water sources deep below the surface. Saltcedar has a high evapotranspiration rate which can dry out springs, drain pools, and even dry up perennial streams (Johnson 1986).

Saltcedar is established along existing water sources within the permit area. Methods that target and destroy the root crown are the only techniques that truly provide plant control. In areas reclaimed by [BNCNTEC](#), if saltcedar becomes well established, appropriate mechanical and/or chemical treatments may be applied to kill at least 90% of the existing saltcedar plants.

3.3.3 Cheatgrass

Cheatgrass, also known as downy brome, is a winter annual grass introduced from Europe and Asia. It is widely distributed throughout most of the United States, Canada, and northern Mexico. Cheatgrass infestations can be found in both native areas and areas disturbed by cultivation and abandonment,

excessive livestock grazing, and repeated fires. Plants geminate in late fall or early spring. This early spring growth habitat helps cheatgrass out compete native plants for water and nutrients.

Cheatgrass infestations are wide spread and well established throughout New Mexico. [BNCNTEC](#) will manage cheatgrass infestations within the permit area by purchasing native seeds and mulch from reputable dealers and establishing diverse, self-sustaining vegetation communities.

4.0 REFERENCES

Johnson, S. 1986. Alien plants drain western waters. *The Nature Conservancy News*, Oct-Nov 1986.

New Mexico State University (NMSU). 2009. Saltcedar Information. NMSU Dept. of Range and Animal Sciences, Las Cruces, New Mexico. <http://age-web.nmsu.edu/saltcedar/> (Verified 13 February 2012).