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**NAVAJO NATION AQUATIC RESOURCE
PROTECTION PROGRAM**

Regulatory Standards for Protection of Rivers, Streams, Lakes,
Wetlands, Riparian Areas and Other Sensitive Aquatic Features On
Navajo Lands

PREPARED BY

NAVAJO NATURAL HERITAGE PROGRAM

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Executive Summary

He named everything he created. He put water on this earth. He made it flow into the rivers and lakes to water this great garden, and to quench the thirst of the people, and animals, plants, birds and fish.

All of the land where we live and where our ancestors lived was created for the people.

Now I see it diminishing gradually little by little until some of us have no place to live. The land changes as our children are changing, and it makes me sad.

Anonymous

Water has always played a major role in the lives of the Navajo People. Surface water serves as the primary source of potable water for many of the Navajo people and its availability was likely a major driving force behind early settlement patterns. Such traditional Navajo activities as farming and livestock production are entirely dependent on an adequate supply of water. The distribution of surface water also dictates the range and density of a myriad of wildlife by creating and supporting various critical habitats. Access to a uninterrupted supply of superior quality surface water is therefore, essential to the survival of the people of the Navajo Nation.

Historically, management of water resources across the United States was based primarily on its practical uses such as for shipping, irrigation, recreation, manufacturing and waste disposal. Additionally, many bodies of water such as swamps, marshes, bogs and floodplains were considered waste land or a nuisance or, worse, hazardous and were actively eliminated. Only recently have the importance and connectivity of these features been recognized and that degradation of water quality or supply in one area can seriously effect quantity or quality in another. Therefore the effective management of water resources requires a better understanding of the complex hydrologic cycle. Modern management techniques recognizes the need for a broad-based management approach including both geomorphic and biologic factors.

Over the last century and a half the aquatic resources of the Navajo Nation have been significantly altered and in some cases irretrievably lost through various land uses primarily involving mining, domestic and irrigation diversion, forestry practices and

grazing pressure. Major impacts to aquatic resources include water quality degradation, erosion, impoundment, dredging, filling and groundwater withdrawal. Through all of this the landscape has slowly changed from one dominated by linear erosional features containing seasonally flowing water to a terrain now dominated by artificially created ponds. Much of the source water has been impacted; nearly all of the springs and seeps have been capped and the water diverted. In addition many of the rivers and streams now receive runoff containing elevated levels of sediment, nutrients and other contaminants.

These changes have had profound effects on an array of organisms including the trees, shrubs and grasses, resident and migratory mammals and birds, fishes and reptiles and even the insects which developed with the landscape and existed for centuries in delicate balance with the natural water cycle.

The Navajo Nation Aquatic Resource Protection Program is designed to provide protection for sensitive aquatic features through application of ecosystem level management techniques. The program is divided into seven major parts covering purpose and intent, goals and policies, specific protection standards, definitions, report guidelines and resource inventory planning. The program consists of four primary efforts:

1. identification and inventory of existing resources,
2. development of an aquatic resource database,
3. evaluation, classification and regulation of impacts to aquatic resources and,
4. monitoring, maintenance and enhancement of ecosystem health and function.

As demands on the limited sources increases it is vital that water supplies be protected and preserved for future generations. However, these efforts need to be accomplished without jeopardizing the future economic development necessary to maintain the independence and strength of the Navajo people. The Navajo Nation Aquatic Protection Program was developed to preserve and protect aquatic resources while retaining the flexibility to accommodate future human and economic growth.

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NAVAJO NATION AQUATIC RESOURCE PROTECTION PROGRAM

PART 1.0. PROGRAM OBJECTIVES

SECTION 1.1. PURPOSE AND INTENT

The purpose of regulating environmentally sensitive areas (see section 1.3 for definition and applicability) is to protect the environment, human life, property and culturally important areas from harm and degradation. Wetlands in particular perform many important biological and physical functions (Table 1). Protection of important aquatic resources will be achieved first through identification, evaluation and categorization of the individual critical watershed components, and second, through uniform application of appropriate environmental management techniques and standards.

The proposed protection plans are in the best interest of the residents of the Navajo Nation and bear a significant relationship to the safety, health and welfare of those residents. The intent of these regulations is to avoid adverse impacts to aquatic resources and in instances of unavoidable impacts, to provide for those impacts to be minimized, rectified, reduced and/or compensated for consistent with the requirements of the Navajo Tribal Code. Protection of environmentally sensitive areas from alteration or degradation assists in preserving and protecting the natural features, environmental functions and values and the natural beauty of the Navajo lands. Protection also controls development and activities within resources lands which can lead to severe environmental degradation including, but not limited to, loss of significant natural vegetation, increased siltation, loss of wildlife habitat, reduced biofiltration and increased geologic instability. Aquatic resources also serve as areas for recreation, education, scientific study, and aesthetic appreciation, while ensuring adequate public facilities and providing opportunities for economic development.

A significant number of these important natural resources have been lost or impaired by activities typically associated with high impact land use development activities such as draining, dredging, filling, excavating, building, grazing and pollution. Unchecked, cumulative losses of aquatic resources due to these practices may, over time, destroy the remaining wetlands, stream environments and riparian areas on Navajo lands. It is therefore necessary to ensure maximum protection for rivers, lakes, wetlands and riparian areas by restricting development activities to lands more suitable

for such activities and away from the environmentally sensitive areas and by encouraging restoration or enhancement of areas already degraded or destroyed by past land use measures.

SECTION 1.2. GOALS AND POLICIES

Goals. It is the goal of the Navajo Nation Aquatic Protection Program to provide for the protection, preservation and enhancement of all aquatic resources, associated habitats and wildlife which are vital to the continued survival and well-being of the people of the Navajo Nation. Also, it is the goal of this program to promote the understanding of the traditional water uses in the daily life of the Navajo people and to recognize the integral part these resources have played in Navajo heritage.

To perpetuate the natural functions of aquatic systems for public benefit, protection must include: water quality maintenance and enhancement, fish and wildlife habitat protection, runoff and flood control, groundwater recharge/discharge, sediment retention, pollution assimilation and streambase flow contribution.

By regulating development and alterations to sensitive areas and their buffers this Chapter seeks to:

1. Protect members of the Navajo Nation, the general public, and both Navajo owned and private resources and facilities from injury, loss of life, property damage or financial losses due to flooding, erosion, reduced water quality and damage to aquatic systems due to soils subsidence or steep slope failure.
2. Direct development to those areas best suited for it and encourage development that is compatible with and sensitive to aquatic systems and which retains existing hydrologic patterns.
3. Protect unique, fragile, and valuable elements of the environment including lakes, streams, wetlands, associated soil and the wildlife and its habitat.
4. Preserve and improve surface water quality and quantity and protect groundwater supplies from degradation.
5. Mitigate impacts to Environmentally Sensitive Areas and their buffers that are excepted, allowed, or otherwise authorized under this chapter by regulating alterations in and adjacent to them.
6. Reduce cumulative adverse environmental impacts to water availability, water quality, wetlands, streams and other aquatic resources.

7. Alert members of the Navajo Nation, including administrative officials, to the development limitations of sensitive areas and their required buffers.
8. Provide land use officials and regulators with the information and authority to protect Environmentally Sensitive Areas and their buffers, and implement the policies of the Navajo Tribal Code.
9. Provide flexibility in the system so that aquatic resource protection is compatible with traditional uses and so that these measures do not significantly effect economic development potential within the Navajo Nation.

Policies. It is the policy of the Navajo Nation Aquatic Resource Protection Plan to develop regulatory standards which will ensure the long-term protection of all aquatic features, their buffers and natural functions and, at the same time, consider that all steep slopes and unstable soils associated with aquatic systems are sensitive and need specific regulatory standards to protect them.

1. All activities including development which may impact sensitive areas are subject to review and permitting procedures.
2. Provide fairness in the application of aquatic resources protection measures by granting additional regulatory flexibility for proposals that have previously been approved.
3. Establish a stream classification procedure based on the level of environmental sensitivity to development impacts, the potential for fish habitat, water quality and stream channel stability.
4. Provide the greatest protection to the most valuable wetlands, including all riparian wetlands and all wetlands larger than one acre.
5. Provide aquatic system protection by requiring buffer areas between the aquatic system and adjacent developable land to protect water quality and habitat.
6. Establish buffer widths based on the value of the aquatic system.
7. Establish a procedure to allow a minor or major deviation from strict regulatory requirements upon demonstration of a net improvement in existing aquatic system functional values.

8. Recognize that trees and other vegetation located adjacent to aquatic systems play a significant role in soil stabilization and stormwater run-off control.
9. Require pretreatment (biofiltration) of stormwater for new projects so that drainage from roadways and parking lots does not directly discharge into streams or wetlands.
10. Encourage the use of non-structural bank protection methods wherever practical including planting vegetation along eroding banks or within floodplains and limit the use of non-living ground cover.

SECTION 1.3. APPLICABILITY

Applicability and Compliance. This chapter contains standards, guidelines, criteria and regulations necessary to identify, analyze and mitigate potential impacts to those portions of the Navajo Nation which contain or are adjacent to environmentally sensitive areas. Environmentally Sensitive Areas are those areas designated as sensitive on such records as National Wetland Inventory (NWI) Maps, USGS Hydrologic maps and U.S. Soil Conservation Service (SCS) Soils Maps and through the use of other maps and information contained in USGS Topographic Maps and Navajo Natural Heritage BCD database information, or by site specific Sensitive Areas Studies. Compliance with the provisions of this Chapter shall be required of all development proposals within Navajo Nation Land except as provided in section 1.5 below.

The Navajo EPA and Navajo Fish and Wildlife Department may approve, approve with conditions, or deny any development proposal in order to carry out the goals, purposes and objectives of this Chapter. The department may also condition or deny a proposal if it is determined that the proposal will: increase the potential of soil movement, result in an unacceptable risk of injury to persons or damage to structures or will result in an unacceptable risk of significant harm to a sensitive area or its functional values. In the event any provision of this Chapter conflicts with any other applicable law or Chapter, that which provides the greatest protection to the Environmentally Sensitive Area shall apply. Approval or permission to conduct development or land use actions in such an area prior to fulfilling the requirements of this Chapter shall not be granted. Proposals for development which will alter or disturb environmentally sensitive areas or their buffers must comply with the provisions of this document. A permit or formal authorization must be obtained for all regulated activities conducted within designated sensitive areas.

Inventory and Mapping. The Navajo EPA shall conduct an inventory of all sensitive areas within the Navajo Nation and shall compile appropriate maps or database information (including habitat maps)

7. Alert members of the Navajo Nation, including administrative officials, to the development limitations of sensitive areas and their required buffers.
8. Provide land use officials and regulators with the information and authority to protect Environmentally Sensitive Areas and their buffers, and implement the policies of the Navajo Tribal Code.
9. Provide flexibility in the system so that aquatic resource protection is compatible with traditional uses and so that these measures do not significantly effect economic development potential within the Navajo Nation.

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documenting those areas. These maps shall be used as a general guide only and are not determinative. The extent and boundaries of wetlands shall be determined in the field according to the procedures and criteria established in this Chapter. Sensitive areas not mapped are presumed to be present on Navajo Land and are protected by the provisions of this regulation. If there is a conflict between the mapped sensitive area and the Criteria and Standards as set forth by this regulation, site specific conditions shall control.

1.3.1. FOREST PRACTICES, UTILITIES INSTALLATION AND ROAD CONSTRUCTION

Road and utility corridors are often constructed across streams and wetlands or along stream or river corridors because such low-lying areas provide the most direct routes with the fewest changes in elevation. The result has been major disruption to the natural hydrological patterns. Ironically, such construction practices sometimes result in the establishment of wetlands where placement of inadequate culverts impound natural drainages behind roadways or utility beds.

Impacts from roads and utilities can be divided into two categories: those occurring during and immediately following construction and those caused by ongoing use and maintenance of the facility. Erosion can be a major concern during construction. Loss of vegetation through clearing and grading compounded by soil compaction and installation of impervious surfaces results in a significant increase in run-off potential.

While most impacts from utility siting may be mitigated through site restoration once the utility line is in place, road impacts continue for as long as the road is in use. Ongoing impacts include use of herbicides and petrochemical pollution from road surfaces and automobiles. Application of salt and sand to road surfaces can be detrimental to adjacent water bodies. In addition, road shoulders constructed too close to aquatic systems where inadequate buffers have been retained may be subject to slope failure and erosion.

Timber harvest activities also impact streams, lakes, wetlands and other water resources by several means, not only through the direct removal of vegetation but also through road construction and skidding operations. These impacts are both immediate ongoing and can profoundly effect the long term functions and values of the effected resources.

Due to the nature and scale of utilities installation, road construction and forestry practices will inevitably impact aquatic resources covered by this regulation in a manner contrary to these regulations. These activities may be granted conditional permission, pursuant to the regulations contained in the

appropriate sections of the Ten Year Forest Management Plan and provided notification of Navajo EPA, Water Department and Fish and Wildlife Department. Compensatory mitigation plans for anticipated impacts must be approved for the entire sale/project prior to project initiation. Approval of plans will be contingent upon assurance of no overall net loss of wetland area or function.

SECTION 1.4. REGULATED ACTIVITIES

The following activities when conducted within an environmentally sensitive area, as defined in this chapter, its associated buffer or when outside of the buffer but potentially effecting the sensitive area or its buffer are regulated:

1. Removing, excavating, disturbing, grading or dredging soil, sand, gravel, minerals, organic matter or natural materials of any kind;
2. Dumping, discharging, placement of dredging spoils or filling with any material;
3. Draining, flooding or disturbing the water level or water table;
4. Constructing, reconstructing, demolishing or altering the size of any structure;
5. Destroying or altering vegetation through clearing, harvesting, or shading or planting vegetation that would alter the character of an environmentally sensitive area (i.e. noxious weeds, exotic or invasive species);
6. Activities that significantly effect water temperature, physical or chemical characteristics of water sources including water quantity and the introduction of pollutants including chemical herbicides, fungicides, pesticides, or excess nutrients;
7. Any other activity potentially effecting any sensitive area or its buffer not otherwise exempt from the provisions of this Chapter.

SECTION 1.5. EXEMPTIONS AND EXCEPTIONS

A. General Exemptions. The provisions of this regulation and any rules contained herein shall not apply to the following:

1. Critical facilities and emergency activities necessary to prevent immediate threat to public health, safety or property;

2. Remodelling, reconstruction or replacement of residential or commercial structures and improvements that do not meet the requirements of this Chapter but which were in existence on the date this chapter becomes effective, provided that such activity does not impact Category I or Category C wetlands, does not increase the impervious area, does not create the potential for soil movement or increase risk of harm or damage to existing uses or to the public safety;
3. Normal and routine maintenance or repair of existing utility structures or developed rights-of-way; or installation, relocation, replacement, operation, or alteration of utilities within existing rights-of-way or easements. However, alterations to fish and wildlife habitats, streams, or wetlands by utility work within an existing right-of-way must be restored, at the least, to its former functional value at the completion of the utility construction;
4. Maintenance, operation and reconstruction of existing roads, streets, and associated structures provided that reconstruction does not impact Category I wetlands and does not increase total impervious area;
5. Existing and ongoing agriculture as defined in Part 3.0 of this regulation. Such activities shall not allow Sensitive Areas or their buffers which are not currently under agricultural use to be converted to agricultural use. Normal and routine maintenance of existing irrigation and drainage ditches shall be exempt except for those ditches used as fish spawning areas;
6. A proposal for building on a lot within a development for which a Sensitive Areas Study previously has been prepared, provided that the previous study contemplated and evaluated the type of development proposed to occur on the lot.
7. Activities involving artificially created wetlands intentionally created from non-wetland sites including biofiltration facilities, detention facilities, sewage treatment facilities and cooling ponds, except wetlands created as mitigation;
8. Site investigative work and studies necessary for preparing and analyzing proposals, including soils studies, water quality studies, wildlife studies and similar tests and investigations, provided that any disturbance of wetland shall be the minimum necessary to carry out the work or studies;

9. Educational activities, scientific research and outdoor recreational activities, such as interpretive field trips, birdwatching and hiking that will not have significant impact on the environmentally sensitive areas and;
10. Minor activities and other low-impact land uses not mentioned above and determined by Fish and Wildlife Department Staff to have minimal impacts to sensitive areas and their buffers.

Except for the emergencies as outlined in subparagraph 1.5.A.1 in this Section, Navajo EPA and Navajo Fish and Wildlife Staff shall review the proposed action and determine whether or not the proposal is subject to these exemption provisions. In all cases, backfilling shall be done with earth or earth materials whenever possible. No property owner or other entity shall undertake exempt activities without prior written authorization from the Navajo EPA and/or Navajo Fish and Wildlife Department. The intention of this section is to allow staff to waive the requirements of this Chapter for actions which are determined to either not pose a threat to a sensitive area or to its buffer, or which are ongoing and existing activities which were in place prior to implementation of this Chapter. In case of any question as to whether a particular activity is exempt from the provisions of this chapter, the determinations of the Navajo EPA and Fish and Wildlife Department shall prevail.

- B. Public Utility Exception.** If the application of this regulation would prohibit the ability to provide service by a public utility, for an existing development or an approved proposal, the utility may apply for an exemption pursuant to this section. After public review the department may approve the exception if they find that there is no other feasible alternative to the proposed installation with less impact on a sensitive area. Proposals approved for an Exception by this Chapter shall be constructed using Best Management Practices as defined within Section 3.0 and in Appendices C, D and G. Projects affecting Category I or Category C wetlands cannot be excepted.

SECTION 1.6. SEQUENCE OF ACTIONS

When an application for a development proposal, as defined by this Chapter, is made a sequence of actions will be required of the applicant, Navajo EPA and Navajo Fish and Wildlife Department staff prior to the staff accepting the permit application into the review process. Staff may request review of the proposal by other resource agency staff or a technical consultant of their choosing.

Actions that may be required include completion of a Sensitive Areas Checklist, vicinity map, Sensitive Areas Study, Hydraulic Alteration Notification, Compensatory Mitigation Plan and a pre-application meeting. Details of the sequence of actions are contained in Appendix A. This section is not intended to create a new permit process for development proposals. To the greatest extent possible, the Navajo EPA and Navajo Fish and Wildlife Department shall integrate and consolidate sensitive areas reviews with other environmental and land-use reviews and considerations.

SECTION 1.7. JURISDICTION

The policies will apply uniformly throughout the Navajo Nation and will provide direction for activities which may occur within or adjacent to sensitive aquatic systems.

SECTION 1.8. BUFFERS

General. The establishment of buffer areas shall be required for all development proposals and land use activities adjacent to a Sensitive Area to protect the functions and values of the aquatic feature. Buffers shall consist of an undisturbed strip of native vegetation extending outward from the delineated sensitive area boundary for a distance specified in Sections 4.2.5, 4.3.5 and 4.4.5. The Department shall have the authority to require buffers depending on the sensitivity of the area, the degree of anticipated impact, and the proposed adjacent land use.

Increasing Buffer Areas. Standard buffers may be increased on a case-by-case basis when Navajo EPA/Fish and Wildlife Department staff determines that a larger buffer is necessary to protect the functions and values of an essential habitat of an area known to be particularly susceptible to disturbance. A substantiated determination, prepared by EPA or Fish and Wildlife Department staff or their representative, shall be attached as a permit condition and shall demonstrate that:

1. A larger buffer is necessary to maintain viable populations of existing species; or
2. The sensitive area is used by species or plant communities which are rare to the area, proposed for listing as endangered, threatened, or sensitive, or contain habitat for these species;
3. The sensitive area is located within 25 feet of the toe of slopes equal to or greater than 30%. Such buffers may be increased to include the top of slopes determined to be erosion hazards which may impact an aquatic resource during a mass wasting event;

4. The proposed land use is incompatible with the sensitive area in question (such as land fills, hazardous wastes storage, incinerators, secondary roads);

Building Setback Lines and Native Growth Protection Areas. A building setback line of 15 feet is required from the edge of the buffer to prevent construction intrusions into the buffer and to allow for emergency vehicle access. In addition, native growth protection areas may be required adjacent to established buffers when it is determined by Navajo Natural Heritage staff that this vegetation is integral in the functioning of the sensitive area.

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PART 2.0. AQUATIC RESOURCE PROTECTION PLAN

Inasmuch as it is recognized that water is essential to life and is a critical component of most ecosystems of the world, water assumes even more importance in the xeric ecosystems found in the arid southwestern United States. The crucial role water played in the every day lives of the ancestors of the native peoples of this area is indisputable and its availability and abundance dictated their distribution and survival. Because of the historical and cultural importance of water to the Navajo people, all natural water and water dependent systems will be considered to be Waters of the Navajo Nation. Waters of the Nation include lakes, rivers, streams, creeks, ponds, cienagas, tinajas, playa lakes and sandflats and all systems influenced by and directly supported by shallow groundwater sources such as wetlands, mudflats and riparian areas. This definition includes intermittent streams and artificially created waters other than waste treatment systems and cooling ponds.

SECTION 2.1. INTRODUCTION

General. Any development proposal on a site which is within, includes, or is adjacent to any sensitive area must be planned, designed and appropriately mitigated so as to demonstrate conformance with the purposes of this Chapter.

Best Management Practices (BMPs). The following Best Management Practices may be required for any alteration occurring in a sensitive area:

1. Sequencing clearing and grading activities to minimize areas of disturbance and allowing for clearing only during the dry season of March 1 through July 1 and September 1 through November 1.
2. Limiting vegetation removal and mandating vegetation retention.
3. Requiring temporary fencing (silt fences) at the clearing limits around sensitive areas and their buffers prior to the start of any land clearing activities on the site.
4. Requiring buffers established pursuant to the development standards established by this Chapter.
5. Requiring additional building setbacks.
6. Limiting or reducing the types or densities of particular uses.

7. Preparation of specific site management plans for temporary sedimentation and erosion control, flood flow management, or other purposes.
8. Site restoration to, at the least, the pre-existing conditions.

SECTION 2.2. WATERSHED PERSPECTIVE

When considering a lake, river, stream, wetland or other body of water it must be remembered that only a small portion of the water contained in that body of water entered as direct precipitation on the water surface. The majority of the water flowing in a stream or standing in a lake is derived from surface or ground water which originates as rain or snowmelt at higher elevations. The area from which water flows into the system is known by several terms: drainage basin, catchment area or watershed. For the purposes of this text the term watershed will be used to define the area which is drained by a single stream system. It is bounded by the "rim" of the drainage basin which follows the highest points between two stream systems. The rim of a watershed will follow the designation termed "Cataloging Unit Boundary" set forth in the Hydrologic Unit Map prepared by the United States Geological Survey

To adequately address protection for a specific water resource, impacts to the entire area which lies above and supplies water to the resource must be considered. In many instances the watershed may be very large and involve several governmental jurisdictions, cross various political boundaries, be subject to numerous ownership claims and support a wide variety of land uses. Watershed level protection will require the cooperation and active participation of all parties having interest in that watershed.

Regulations promulgated by this program are necessarily designed to be used on a site-specific basis. No attempt is made to design coordinated regulation for all activities within an entire watershed. It is anticipated that future cataloging and inventory activities will lead to the development of a comprehensive watershed management plan for the Navajo Nation and will incorporate these standards as part of future protection plans.

SECTION 2.3. AQUATIC HABITAT ECOLOGY

The following sections describe areas, as defined in Section 3.0, which are classified as sensitive areas: lakes and ponds, rivers and streams, wetlands, riparian areas and frequently flooded areas, geologically hazardous areas, and wildlife habitat conservation areas.

Poorly planned and controlled construction and land development can have very serious negative consequences for the streams, lakes, wetlands and groundwater which comprise the hydrological system. A basic understanding of the hydrological cycle of a drainage basin is necessary in order to minimize land use-related impacts.

The cycle begins with precipitation falling to the earth. When it rains one of three things happens to the water. It either soaks into the earth in a process called infiltration, returns to the atmosphere through evaporation, or it flows into a lake, river, stream, wetland or other water body.

In a natural watershed very little run-off reaches water bodies, except during extreme storm conditions. Instead, the water is absorbed by porous soils. It sinks into the ground where it is made available to the roots of plants, or it adds to the supply of groundwater. Vegetation slows and impedes run-off aiding the soil's absorption and groundwater recharge capabilities. Because groundwater moves more slowly than surface runoff, in dryer months the stored water will recharge stream flows and maintain shallow groundwater levels.

Wetlands play a significant role in the natural hydrological cycle of the watershed. During flood events wetlands store flood and runoff waters, releasing them slowly when they are needed by streams to maintain base flows. Wetlands maintain water quality by filtering out sediments and pollutants before they can reach streams and lakes. Retention of wetlands in a natural, unpolluted condition is essential for providing clean, abundant drinking water to those areas dependent on aquifers and well systems.

2.3.3. Wetlands

Wetlands provide a variety of valuable and often irreplaceable functions for the people of the Navajo Nation. Among them are maintenance of surface and groundwater quality, flood control, productive wildlife habitat, streambase flow contribution, groundwater discharge and recharge, recreation, education and erosion control. The degree to which a wetland can provide a given function is called the value of the wetland and is based on such factors as the size and configuration of the wetland, soil and biological composition, position in the watershed, connectivity to other water bodies and proximity to inhabited areas. Table 1 provides a brief discussion of the primary functions and values of wetlands and describes the typical environmental conditions which produce the highest and lowest values for each function.

Wetlands are areas of transition between permanently flooded areas and dry land and are usually associated with areas of high water table. They are typically associated with rivers, streams, lakes, and other shorelines and are often referred to as marshes, swamps or bogs. Since the early days of European influence within Navajo

Lands many acres of wetlands have been lost through direct action such as diking, draining and filling. Additionally, many of the wetlands associated with river and stream floodplains have been converted to agricultural and residential uses. Functional value of virtually all of the wetlands located on Navajo Lands have been impacted to some degree by mining, forestry practices, agriculture, grazing or industrial uses. Wetlands once viewed as "waste lands" are today understood to be an integral and essential link in the hydrological cycle.

Many species of ducks, shorebirds and raptors feed, breed and nest in wetlands. Navajo wetlands support a number of sensitive species which have merited special attention from the Navajo Fish and Wildlife Department including great blue heron, bald eagle and beaver. Several plant species such as Navajo sedge and Parish's alkali grass have also been identified within Navajo wetlands. Otters, mink, and raccoon are species of mammals dependent on wetlands and riverine systems for their existence. Wetlands provide shelter to the young of many species seeking to escape larger predators.

Although all wetlands perform important biological functions, they do not perform them to the same degree. Some aquatic resources, such as habitat for endangered species, steep stream banks, riparian wetlands or wetlands which play a key role in recharging groundwater supplies, may be especially susceptible to disturbance from land development activities. Rating processes for both streams and wetlands which consider degree of sensitivity and functional performance of aquatic resources will provide a flexible management approach that is responsive to resource protection needs while accommodating the demands of growth.

Table 1. Wetland Functions and Values

Wetland value is not synonymous with wetland function. Wetland function is what a wetland does, regardless of the interpretation of its worth, whereas wetland value is an interpretation of the relative worth of a wetland function and can be either positive or negative.

1. Groundwater Discharge (springs, seeps, cienagas)/Groundwater Recharge

Definition. In many parts of Navajo Nation, especially in the watersheds which include the higher slopes of the Chuska Mountains, the interaction between plentiful rainfall, surface water, wetlands and groundwater is ever-changing. During dry summer months wetlands that are located over aquifers are most likely acting to recharge groundwater supplies (aquifer recharge area). During wet winter months the same wetlands may serve as discharge points for the same aquifer supplying surface water for biological productivity.

Highest Value. Permanently saturated or inundated systems and presence of numerous seeps and springs (discharge). Year-round open water wetlands greater than 10 acres in size with water depths greater than 10 feet (recharge).

Lowest Value. Small, temporarily/seasonally flooded wetlands in hydrologically isolated depressions.

2. Streambase Flow Contribution Potential

Definition. During times of summer low flows, streams are dependent upon the ability of wetlands within their watersheds to store and slowly discharge waters to maintain in-stream flows. This role is the opposite of the role performed by wetlands during months of winter storms and high flows when water moves from the stream to the wetlands and floodplains. Loss of wetlands increases the "flashiness" of a stream creating peak flows of shorter duration and larger volumes.

Highest Value. Presence of numerous seeps and springs. Wetlands with a low recharge rate located in the upper segment of the watershed and is either connected to another wetland or has a permanent outlet to a stream. The wetland must be either permanently flooded, have outflow greater than inflow or be located in an area where topography favors discharge.

Lowest Value. Location in the lower portion of the watershed and has either a high recharge rate, no permanent outlet to a stream or is not connected to a stream.

3. Shoreline/Sediment Stabilization

Definition. Wetlands act to slow peak floodwater flows, dissipate energy and reducing the potential for erosion. Wetlands store large amounts of water during storm events and release it slowly to the receiving streams. Wetland vegetation serves to trap and hold alluvial sediments and help colonize new sediment deposits. Riparian wetland play an essential role in preventing or reducing bank erosion.

Highest Value. Woody streamside vegetation at least 200 yards in width.

Lowest Value. Submergent vegetation less than 100 yards wide.

4. Water Quality Improvement

Definition. Wetlands intercept stormwater runoff before it enters lakes or streams. Pollutants and sediment contained in the runoff are absorbed and filtered out by wetland soils and wetland vegetation. However, wetlands are not entirely immune to the input of such materials. Wetlands that receive stormwater containing burdens of silt and organic debris will become converted to uplands, in an acceleration of the natural process of eutrophication. Also, some pollutants may be cycled

through the wetland and transported to adjacent aquatic systems when the wetland vegetation that absorbed the pollutants dies. Therefore it is necessary to treat urban stormwater before it enters wetlands to lessen such impacts. Highest Value. Wetlands with soils composed of a high percentage of organic material provide the highest value for toxicant reduction. Wetlands with large areas of reduced water velocity containing vigorous plant growth provide highest value for sediment retention and nutrient uptake and conversion. These wetlands must be located in an area with pollutant removal opportunity, that is, in areas with point or non-point sources of pollution. Lowest Value. Fast-flowing streambed composed of mineral soils, with minimal plant growth and no pollutant inputs.

5. Storm and Floodwater Management

Definition. Wetlands serve to lessen the flood impacts in several ways. Riparian wetlands and the adjacent floodplain lands provide a floodway for the movement of floodwaters. As floodwaters spread out across the floodplain their velocity and wave height is reduced. Peat soils and wet-tolerant vegetation in wetlands acts as a sponge absorbing floodwaters and releasing them over time, thereby lessening adjacent and downstream impacts. Sediments carried in the floodwaters settle out in wetlands and floodplains, saving the expense of costly dredging of downstream navigational channels. Wetlands actually lessen the height of flood stages which in turn saves millions of dollars in flood damage repair.

Highest Value. Wetlands with impermeable or slowly permeable soils comprising less than 5 percent of the upper watershed and with either no permanent outlet or a constricted outlet. If the wetland has an unconstricted outlet then located in a floodplain or an area exhibiting evidence of expansive flooding within one year. Generally these wetlands are larger than 5 acres.

Lowest Value. Wetlands less than 5 acres.

6. Wildlife Habitat Provision and Biological Functions

Definition. Wetlands are especially important for the habitat they provide for fish, wildlife, and waterfowl. The basis for the high productivity of most wetlands is a food chain based on detritus, or decaying plant and animal material. Detritus is fed upon by microbial decomposers. These minute organisms provide food in turn for larger invertebrates such as the larvae of midges, mosquitoes and crane flies. The populations of insects and other invertebrates provide an ample food supply for large numbers of fish and birds.

In addition to an abundant food source wetlands provide other important habitat components used by a wide variety of wildlife. Snags and downed woody debris are used for perch site, nesting and cover. The edge between wetland and upland as well as between different plant communities of varying heights provides structural diversity that allows for utilization by a wide variety of wildlife. Wetlands also provide opportunities for refuge from predators and reduce visual and noise disturbance.

Highest Value. Wetlands with high plant community diversity which can support valuable species and can provide relatively equal proportions of open water and vegetative cover. Areas of dense shrubby vegetation offering good refuge potential and connectivity to other quality habitats.

Lowest Value. Absence of or limited manifestation of plant community diversity, valuable species support and relatively unequal proportions of open water and vegetative cover. Lack of refuge potential and connectivity with other quality habitats.

7. Cultural/Heritage Value

Definition. A large number of wetlands and riparian areas on the Navajo Nation possess important historical and archeological sites. Many villages and home sites were located near wetlands and riparian areas which served as sources for fish, game and water. Riparian vegetation also provided food, shelter, tools and fuel. Wetlands and riparian areas were extensively used for agricultural production because of the ready supply of water and typically fertile soil.

Highest Value. Permanently saturated or inundated systems and those supplying flowing surface water. Riparian wetlands associated with permanent streams.

Lowest Value. Small temporarily flooded or saturated wetlands in topographic low areas.

8. Education and Recreation

The unique species that inhabit wetlands and the intricate biological processes that occur throughout the year make wetlands ideal outdoor laboratories for students of all ages. For students from preschoolers to doctoral candidates wetlands contain mysteries to be contemplated, unraveled and enjoyed.

The same principle applies to recreational opportunities. The abundant beauty, the peaceful quiet and solitude, make wetlands a natural choice for the passive recreationalist out for a day hike or canoe trip. Anglers, hunters, bird watchers and photographers are attracted by the abundant wildlife and moving scenery.

Highest Value: Normally functioning wetlands with high community and class diversity, exhibiting minimal impacts and located near population centers.

Lowest Value: Small, isolated wetlands and/or those which are severely impacted.

SECTION 2.4. FISH AND WILDLIFE AQUATIC HABITAT CONSERVATION AREAS

Fish and Wildlife Aquatic Habitat Conservation Areas are those areas within the Navajo Nation defined as aquatic habitats in Section 3.0 of this regulation, which provide habitat for Navajo listed rare, endangered, threatened, or sensitive species; for species of local importance as identified in the Administrative Rules; or for aquatic habitat communities of exceptional habitat value inventoried and mapped within the Nation. Aquatic habitats for dependent species such as fish, amphibians and aquatic insects are also regulated under Section 4.2 relating to streams, Section 4.3 relating to lakes, and Section 4.4 relating to wetlands. Wildlife Habitat Conservation Areas may be classified as either Critical or Sensitive based on the criteria provided.

Critical Habitats. Known or documented habitat for any species listed by the Navajo Fish and Wildlife Department as rare, endangered, threatened, or sensitive. Approximate locations of such habitats will be available, upon request, from the Navajo Fish and Wildlife Department office. Mapped locations of habitat for known listed species shall not be made available for public disclosure.

Significant Habitats. Inventoried and mapped habitat for species identified as having local significance within the Navajo Nation. Areas may include, for example, specific areas known to be utilized by large numbers of migratory waterfowl.

SECTION 2.5. GEOLOGICALLY HAZARDOUS AREAS WITHIN AQUATIC SYSTEMS

Those areas subject to potential erosion, landslide, or other instabilities which could adversely affect an aquatic resource, include the following:

1. **Erosion Hazard Areas.** Erosion Hazard Areas are those areas of the Navajo Nation which contain soils that may experience severe to very severe erosion hazard when they occur on slopes of fifteen percent (15%) or greater. Erosion hazard may be determined from SCS Soil maps.
2. **Landslide Hazard Areas.** Landslide Hazard Areas are those areas of the Navajo Nation which by reason of excessively steep slopes, unsatisfactory foundation support, stability, or topography have a risk of earth subsidence and landslide hazard in excess of normal occurrences, and which through proximity, position, or drainage have the potential to impact aquatic resources. Field criteria for identifying Landslide Hazard Areas include the following:

- a. Any area with an average slope of fifteen percent (15%) or greater and impermeable soils (typically silt and clay) frequently interbedded with granular soils (predominantly sand and gravel) and springs or groundwater seepage;
 - b. Any area which includes areas with significant visible evidence of groundwater seepage, and which also includes existing landslide deposits regardless of slope;
 - c. Any area potentially unstable as a result of rapid stream incision or bank erosion; or
 - d. Any area located on an alluvial fan, presently subject to inundation by debris flow or deposition of stream-transported sediments.
3. Areas of special flood hazard as defined in section 3.0.

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PART 3.0. DEFINITIONS

Activity means any land use action that requires involvement of the Navajo Environmental Protection Administration or Navajo Fish and Wildlife Department.

Adjacent Activity means any land use activity which adversely impacts the existing condition of a sensitive area even though the activity may not directly contact the sensitive area or its buffer. For the purposes of this regulation, adjacency is typically considered to be any alteration within 500 feet of an environmentally sensitive area.

Adjacent means bordering, contiguous or neighboring. Wetlands separated from other waters of the Navajo Nation by man-made dikes or barriers, natural river berms and the like are considered adjacent wetlands.

Alluvium means all soil deposits transported by surface water.

Alteration means any human-induced action which changes the existing condition of a Sensitive Area or its buffer. Alterations include, but are not limited to: grading; filling; dredging; draining; channelizing; cutting, pruning, limbing, topping, clearing, relocating or removing vegetation; applying herbicides or pesticides or any hazardous or toxic substance; discharging pollutants (except stormwater); grazing domestic animals; paving, construction, dumping and demolition, application of gravel; modifying for surface water management purposes; or any other human activity that changes the existing landforms, vegetation, hydrology, wildlife or wildlife habitat value of a Sensitive Area. Alteration does not include walking, passive recreation, fishing or other similar activities.

Applicant means the person, party, firm, corporation, or other private or public entity which applies for a development proposal, permit or approval subject to review by the Navajo Environmental Protection Administration and/or the Navajo Fish and Wildlife Department under the provisions of this regulation.

Aquatic Systems means all surface and vadose waters including, but not limited to, rivers, streams, ponds, lakes, and wetlands.

Aquifer Recharge Area means an area where, due to highly permeable soils, water infiltrates from the surface to groundwater aquifers. Recharge areas vary in sensitivity depending on the soil and groundwater conditions. Potential risks to the recharge area depend on the combined effects of hydrological susceptibility to contamination and contaminant loading potential, as follows:

1. Low Significance Aquifer Recharge Areas are uplands and sloping areas underlain by silt, clay or glacial till.

2. Medium Significance Aquifer Recharge Areas are valley floors underlain by relatively fine-grained alluvial soils.
3. High Significance Aquifer Recharge Areas are uplands and sloping areas underlain predominantly by sand and gravel, and valley floors underlain by relatively coarse alluvium.
4. Critical Aquifer Recharge Areas are identical to high significance aquifer recharge areas except that the aquifer is a source of drinking water.

Artificially Created Wetland means wetlands purposely created from non-wetland sites through legally authorized human action, including irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities.

Area of Special Flood Hazard means the land in the floodplain subject to a one percent or greater chance of flooding in any given year.

Average Slope means the average grade of land within each land area representing a distinct topographic change.

Backfill means any material placed into an excavated area, pit, trench or behind a constructed retaining wall or foundation.

Base Flood means a flood having a one percent chance of being equaled or exceeded in any give year. It is also referred to as the "100-year flood." In areas where the Flood Insurance Study includes detailed base flood calculations, those calculations may be used until projections of future flows are completed and approved by Navajo EPA.

Base Flood Elevation means the water surface elevation of the base flood.

Basin means the region from which water drains into a stream.

Best Management Practices (BMPs) means a system of management practices and measures that:

1. control soil loss and reduce adverse impacts to water quality caused by addition of nutrients, animal waste, and toxics;
2. control the movement of sediment and erosion caused by land alteration activities;
3. minimize adverse impacts to the chemical, physical, and biological characteristics of sensitive areas.

Biologist means a person who has earned a degree in biological sciences from an accredited college or university, or a person who has equivalent educational training and has experience as a practicing biologist.

Bond means a surety bond, cash deposit or escrow account, assignment of savings, irrevocable letter of credit or other means acceptable to the Director to assure work is completed in accordance with all applicable regulatory requirements.

Buffer or Buffer Area means a strip of land composed of an undisturbed and naturally vegetated (or enhanced or rehabilitated vegetative zone) extending outward from the edge of - and is an integral part of - the stream or wetland ecosystem or other designated sensitive area. Buffer widths are established pursuant to the provisions of this regulation and are designed to protect slope stability, attenuate surface flows, reduce landslide and erosion hazards to minimize risk to persons or property and to protect the integrity and value of the aquatic system from influences interfering with its natural function and to provide valuable habitat for wildlife.

Building Setback Line means a line which establishes a definite point beyond which the foundation of a building shall not extend. This is not the same as a buffer. The building setback line allows access to all sides of a building for construction equipment and emergency vehicles without entering a sensitive area.

Canopy means the highest layer of vegetation within a forest community.

Channel means an open conduit which periodically or continuously contains water, or which forms a connecting link between two bodies of water.

Cienaga means a spring-fed marsh. A southwestern wetland.

Class see "Wetland Class"

Clearing means the exposure of the earth's surface by cutting or removal of timber, brush, grass, ground cover or other organic plant material by physical, mechanical, chemical, or any other means.

Coal Mine Hazard Areas means those areas of the Navajo Nation directly underlain by or adjacent to or affected by abandoned coal mine workings such as adits, tunnels, drifts or air shafts or where mine tailings are present.

Compensation means any action(s) specifically designed to replace project-induced Sensitive Area or buffer losses. Compensatory mitigation can include, but is not limited to restoration or creation of lost or impacted functional values. Compensation project design elements include, but are not limited to: land acquisition procedures; detailed plans including: functional value assessments, project impacts, goals and objectives, detailed

landscaping designs, construction drawings, and performance standards, monitoring and contingency plans.

Compensatory Storage means any new, excavated storage volume equivalent to any flood storage capacity which has been or would be eliminated by filling or grading within the flood plain. Equivalent shall mean that the storage removed shall be replaced by an equal volume that is hydraulically connected to the floodway.

Creation means the purposeful and legally authorized establishment of a wetland or stream from an upland (non-wetland or dry) site through artificial means.

Critical Facilities means those facilities necessary to protect the public health, safety and general welfare which are defined under the occupancy categories of Essential Facilities, Hazardous Facilities and Special Occupancy Structures in the Uniform Building Code Table No. 23-K (1988). These facilities include but are not limited to schools, hospitals, police stations, fire departments and other emergency response facilities, and nursing homes. Critical facilities also include sites of hazardous materials storage or production.

Developable Area means the area outside of any sensitive area and its required buffer.

Development Activity means any work, condition or activity which requires a permit or approval under this regulation.

Development Proposal means any of the activities relating to the use and/or development of land requiring a permit or approval from Navajo EPA, Navajo Fish and Wildlife Department or Navajo Water Resources Department as set forth in section 1.4. Development activity includes but is not limited to: commercial or residential building development; franchises; rights-of-way; grading and clearing; planned residential development; flood hazard control; unclassified use; utility and other use; variance; or any subsequently required permit or approval not expressly exempted by this Chapter.

Development Proposal Site means the legal boundaries of the parcel or parcels of land for which the applicant has applied for development permits.

Drainage Impacts means the loss or impairment of existing water quality, water storage, retention and detention capacity and or water conveyance ability as a result of development activity.

Drainage Facility means the system of collecting, conveying and storing surface and storm water runoff. Drainage facilities shall include but not be limited to all surface and storm water runoff conveyance and containment facilities including streams, pipelines,

channels, ditches, infiltration facilities, retention/detention facilities, and other drainage structures both natural and man-made.

Drainage Plan means a plan prepared, where appropriate, by or on behalf of the applicant which identifies existing drainage conditions at the location of the proposed land use activity, and identifies the proposed means of reducing anticipated impacts to natural drainage systems, created drainage facilities, surface, and subsurface water associated with a proposed activity.

Dredging means the removal of earth and other materials from the bottom of a body of water or watercourse or from a wetland.

Dredging Spoils means the earth and other materials removed from the bottom of a body of water or watercourse or from a wetland by dredging.

Dry Land means the area of the subject property landward of the high waterline.

Earth/Earth Material means naturally occurring rock, soil, stone, sediment or combination thereof.

Easement means land which has specific air, surface or subsurface rights which are conveyed for use by someone other than the owner of the subject property or to benefit some property other than the subject property.

Ecologically Significant Wetlands means those wetlands on the Navajo Nation which provide outstanding wetland function, are dominated by plant associations of infrequent occurrence, are determined to be regionally rare wetlands or offer primary support for threatened or endangered plant or animal species.

Elevated Construction means a construction technique that uses posts or pilings to raise a structure above the flood plain so that water can flow freely beneath the structure.

Enhancement means an action which increases the functions and values of an existing viable wetland, stream or habitat area or the buffers established for such areas, such as by increasing plant diversity and wildlife habitat, installing environmentally-compatible erosion controls, or removing non-indigenous plant or animal species. Enhancement also includes actions performed as a compensation project by increasing existing functional values, restoring lost functional values, or introducing new functional values to improve the quality of an existing degraded wetland, stream or habitat area.

Erosion means the process of wearing away the earth's surface through the mobilization and transportation of particles by natural agents such as wind, rain splash, frost action or stream flow.

Erosion and Deposition means the removal of soils and the placement of these removed soils elsewhere by the natural forces of wind or water.

Erosion Hazard Areas means those areas of the Navajo Nation underlain by soils which, based on a combination of slope inclination and the characteristics of the underlying soils, are susceptible to varying degrees of risk of erosion. According to the U.S. Soil Conservation Service Soil Survey, these soils have "severe" to "very severe" erosion hazard potential, especially when they occur on slopes of 15 percent or greater.

Essential Habitat means habitat necessary for the survival of federally listed threatened, endangered and sensitive species and Navajo Fish and Wildlife Department listed priority species and which, if altered, could reduce the likelihood that the species will maintain and reproduce over the long term. Such areas are identified with reference to lists, categories and definitions promulgated by the Navajo Fish and Wildlife Department. All wetlands that are part of an essential habitat are classified Category I wetlands.

Excavation or Excavate means the mechanical removal of surface soils and/or underlying strata.

Existing and Ongoing Agricultural Activities means those activities involved in the production of crops and livestock, including but not limited to operation and maintenance of farm and stock ponds or drainage ditches, irrigation systems, changes between agricultural activities and normal operation and maintenance or repair of existing serviceable structures, facilities or improved areas. Activities which bring an area into agricultural use are not part of an on-going activity. An operation ceases to be on-going when the areas on which it was conducted is proposed for conversion to a non-agricultural use or has lain idle for a periods of longer than five years, unless the idle land is registered in a federal, state or tribal soils conservation program. Forest practices are not included in this definition.

Exotic Species means any species of plant or animal that is foreign to the Navajo Nation.

Federal Manual or Federal Methodology means the field methodology for identifying and delineating wetlands in the field as described in the Corps of Engineers Wetlands Delineation Manual (1987).

Fill/Fill Material means a deposit of earth material, structural rock or gravel, broken concrete and similar structural substances

customarily used to raise the level of the ground, placed by human or mechanical (machine) means. Excluding topsoil, bark, ornamental rocks, or gravel placed on the surface of the ground.

Filling means the act of transporting, placing or depositing (by any manner or mechanism) fill material from, to, or on any soil surface, sediment surface, or other fill material.

Flood Hazard Areas means those areas of the Navajo Nation subject to inundation by the base flood (i.e. area of one-hundred-year flood). A flood hazard area consists of the following components which shall be determined by the reviewing department after obtaining available floodway data:

1. Floodplain means the total area including but not limited to land adjoining a river, stream, watercourse, or lake subject to inundation by a "100-year flood". A "100-year flood" means a flood (of surface runoff from any source) having a one percent chance of being equaled or exceeded in any given year;
2. Flood Fringe means that portion of the floodplain outside of the zero-rise floodway which is covered by floodwaters during the base flood; it is generally associated with standing water rather than rapidly flowing water;
3. Federal Emergency Management Agency (FEMA) Floodway means the channel of the stream and that portion of the adjoining floodplain which is necessary to contain and discharge the base flood flow without increasing the base flood elevation more than one foot.

Flood Protection Elevation means the elevation that is one foot above the zero-rise floodway.

Functions or Functional Values means the highly beneficial roles served by an aquatic system and its buffer including, but not limited to: water supply, water quality protection and enhancement; fish and wildlife habitat; food chain support; flood storage, absorption, conveyance and attenuation and upland flood protection; streambase contribution; groundwater recharge and discharge; erosion control, sediment entrapment, pollution assimilation; shore stabilization; aesthetic value protection, noise and visual screening; and recreation. These roles are not listed in order of priority.

Geologically Hazardous Areas means those areas which, because of their susceptibility to erosion, landsliding, or other geological events, are not suited to siting commercial, residential, or industrial development consistent with public health or safety concerns. These areas may also be characterized by geologic and hydrologic conditions that make them vulnerable to contamination of groundwater supplies through infiltration of contaminants in aquifer recharge areas. Field criteria for identifying Geologically Hazardous Areas include the following:

1. Erosion Hazard Areas are those areas having severe to very severe erosion hazard due to natural agents such as wind, rain, splash, frost action, or stream flow.
2. Landslide Hazard Areas are those areas of the Navajo Nation that are potentially subject to episodic downslope movement of a mass of soil or rock.
3. Steep Slope Hazard Areas are those areas with a slope of forty percent or greater and with a vertical relief of ten or more feet (a vertical rise of ten feet or more for every twenty-five feet of horizontal distance). A slope is delineated by establishing its toe and top, and measured by averaging the inclination over at least ten feet of vertical relief.

Geologist means a person who has earned a degree in geology from an accredited college or university, or a person who has equivalent educational training and has experience as a practicing geologist.

Geotechnical Engineer means a practicing, geotechnical/civil engineer state-licensed as a professional Civil Engineer and approved by the Navajo Engineering Design Department who has at least four years of professional employment as a geotechnical engineer with experience in landslide evaluation.

Grading means any one or combination of excavating, filling, clearing, leveling, contouring, or the removal of the ground surface by human or mechanical means. This definition includes the construction of ditches and channels.

Habitat Map means maps of plant cover or communities types adopted by the Navajo Fish and Wildlife Department to indicate the potential presence of wildlife species.

High Impact Land Use means land uses which are associated with moderate or high levels of human disturbance or substantial impacts to sensitive areas, including but not limited to medium and high density residential, multi-family residential, active recreation, forest management and commercial and industrial land uses.

Hydraulic Alteration Notification (HAN) means written notification to the permit office of action to be taken in waterways, stream channels, lakes or other aquatic resources. See Appendix J.

Impervious Areas means those areas which, due to hard surfacing such as paving or soil compaction and coverage by buildings, effectively prevents or retards the entry of water into the soil and also causes runoff of surface water in greater quantities and flow rates than under normal conditions.

In-Kind Mitigation means replacement of wetlands with substitute wetlands whose characteristics closely approximate those destroyed or degraded by a regulated activity.

Intentionally Created Streams means those streams created through purposeful human action, such as irrigation and drainage ditches, grass-lined swales, and canals.

Isolated Wetlands means wetlands that are not hydrologically connected to other surface water features, either by above ground flows or shallow subsurface flows, indicated by the presence of hydrophytic vegetation or hydric soils between the wetland and the surface water features.

Lake means any naturally existing or artificially created body of standing water, including reservoirs, which exists on a year-round basis and occurs in a depression of land or expanded part of a stream. A lake must be greater than one acre in size, greater than 2 meters (6.6 feet) in depth at the deepest point, and have less than 30% areal coverage by trees, shrubs, or emergent vegetation. A lake is bounded by the ordinary high water mark or, where a stream enters the lake, the extension of the elevation of the lake's ordinary high water mark within the stream. A lake does not include entirely artificial structures such as cooling, mill or ornamental ponds created by man.

Landslide means episodic downslope movement of a mass of soil, rock, and includes snow avalanches.

Landslide Hazard Areas means those areas of the Navajo Nation that, due to a combination of slope inclination and relative soil permeability, are susceptible to varying degrees of risk of landsliding. Landslide hazard areas are classified as Classes I-IV based on the degree of risk as follows:

1. Class I/Low Hazard. Areas with slopes of less than 15 percent.
2. Class II/Moderate Hazard. Areas with slopes of between 15 and 40 percent and that are underlain by soils that consist largely of sand, gravel or glacial till.
3. Class III/High Hazard. Areas with slopes between 15 and 40 percent that are underlain by soils consisting largely of silt and clay.
4. Class IV/Very High Hazard. Areas with slopes greater than 15 percent with mappable zones of emergent water (e.g. springs or groundwater seepage), areas of known (mappable) landslide deposits, regardless of slope, and all areas sloping more steeply than 40 percent.

Low Impact Land Use means land uses which are associated with low levels of human disturbance or low levels of impacts to sensitive areas including, but not limited to, passive recreation, open space, or cultural land uses.

Mitigation means the offsetting of impacts to the functional values of aquatic systems and/or their buffers through the use of any or all of the following actions that are listed in descending order of

preference. While monitoring without additional actions is not considered mitigation for the purposes of these regulations, it may be a part of a comprehensive mitigation program.

1. Avoid the impact altogether by not taking a certain action or parts of an action;
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
3. Rectify the impact by repairing, rehabilitating or restoring the affected environment;
4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;
5. Compensate for the impact by replacing, enhancing, or providing substitute resources or environments, and;
6. Monitor the impact and the compensation project and taking appropriate corrective measures.

Monitoring means evaluating the impacts of land use proposals on the biological, hydrologic and geologic elements of natural systems and assessing the performance of required mitigation measures through the collection and analysis of data by various methods for the purposes of understanding and documenting changes in natural ecosystems and features, and includes gathering baseline data.

Native Growth Protection Areas (NGPA) means an area set aside for the protection of native vegetation adjacent to a sensitive area or its buffer.

Native Vegetation means vegetation comprised of plant species which are indigenous to the Navajo Nation and which reasonably could have been expected to naturally occur on the site. Native vegetation does not include noxious weeds.

Natural Features means the physical characteristics of an area that are not man-made.

Natural Materials means materials chemically unaltered from their natural state.

Non-Conformance or Non-Compliance means any land use, structure, condition, activity or any other utilization of property that does not conform to any of the provisions of this regulation or that did not receive approval through the appropriate decision-making process required under this Regulation.

Non-Living Ground Cover means gravel, rock or similar non-polluting material through which water can freely percolate to the soil beneath.

Normal Rainfall means rainfall that is at or near the mean of the accumulated annual rainfall record.

Noxious Weed means any plant which when established is highly destructive, competitive, or difficult to control by cultural or chemical practices.

Open Space means land not covered by buildings, roadways, parking lots or other surfaces through which water can not percolate into the underlying soil.

Ordinary High Water Mark (OHW) means the mark that will be found by examining the bed and banks of a stream or lake and ascertaining where the presence and action of water are so common and usual, and so enduring in all ordinary years, as to establish a vegetative character on the soil distinct from that of the abutting upland. In any area where the ordinary high water mark cannot be found, the line of mean high water shall substitute. In any area where neither can be found, the top of the channel bank shall be substituted. In braided channels and alluvial fans, the ordinary high water mark or substitute shall be measured so as to include the entire stream feature.

Out-of-Kind Mitigation means the replacement of wetlands with substitute wetlands whose characteristics do not closely approximate those destroyed or degraded by a regulated activity.

Permanent Erosion Control means continuous on-site and off-site control measures that are needed to control sediment transport or deposition, turbidity or pollutants after alteration or restoration.

Plant Associations of Infrequent Occurrence means one or more plant species on a landform type which because of the rarity of the habitat or the species involved or both, or for other botanical or environmental reasons, do not often occur on the Navajo Nation.

Playas are normally dry, closed basin lakes. Evaporation and infiltration are typically the only means of discharge from a playa. The term playa includes that area subject to periodic inundation and an area within fifty feet of the normal high water mark.

Qualified Consultant means, for the purposes of these regulations, a person who has attained a degree from and accredited college or university in the subject matter necessary to evaluate the sensitive area in question (e.g. biology or ecology for wetlands, streams and wildlife habitat; geology and/or civil engineering for geologic hazards etc.), and/or who is professionally trained and/or certified or licensed to practice in the scientific disciplines necessary to identify, evaluate, manage and mitigate impacts to the sensitive areas in question.

Regulated Activity means any activity occurring in or adjacent to and/or potentially affecting a sensitive area that is subject to

the provisions of this Chapter. Regulated activities include but are not limited to any filling, dredging, dumping or stockpiling, draining, excavation, flooding clearing or grading, construction or reconstruction, obstructing, shading, clearing or harvesting.

Regulated Wetlands means all wetlands as defined in this section delineated per the federal manual and subsequent United States Army Corps of Engineers regulatory guidance letters. Although a site-specific wetland may not meet the criteria described above, it will be considered a regulated wetland if it is functionally related to another that meets the criteria.

Rehabilitation means the re-establishment of a viable stream or wetland from a previously filled or degrade stream reach or wetland.

Resource Lands or Natural Resource Lands means those areas of the Navajo Nation with long-term commercial timber, agricultural, and mineral values.

Restoration means the actions to return a previously destroyed or degraded stream, wetland or other sensitive area to a state in which its stability, functions and values approach its unaltered state as closely as possible.

Retention/Detention Facility means a type of drainage facility designed either to hold water for a considerable length of time and then release it by evaporation, plant transpiration and/or infiltration into the ground; or to hold runoff for a short period of time and then release it to the surface and storm water management system.

Riparian Wetlands means those wetlands that are functionally related to and occur within or partially within the flood plain of any river or stream and those wetlands which serve as discharge points forming the headwaters of a stream.

Sensitive Areas or Environmentally Sensitive Areas means any of those areas on the Navajo Nation which support unique, fragile, or valuable natural resources including fishes, wildlife and other organisms and their habitat and such resources which, in their natural state carry, hold or purify water. This definition also includes those areas which are subject to natural hazards which may adversely impact the functions of the resource listed above. Sensitive areas include the following landform features: wetlands, lakes, streams, erosion hazard areas, coal mine hazard areas, land-slide hazard areas, flood hazard areas, and the adjoining protective buffers necessary to protect the public health, safety and welfare, each as defined in this title.

Sensitive Area Review means the evaluation performed by the Navajo Fish and Wildlife Department as part of its review of an

application for a permit or approval to ensure that impacts to sensitive areas have been addressed where appropriate.

Significant Natural Vegetation means any area containing a concentration of significant trees and any area containing dense, mature, native vegetation.

Significant Trees means any evergreen or deciduous tree 25 inches in circumference or greater, measured one foot above the root crown.

Sediment means the soil particles mobilized and deposited by the processes of erosion and deposition.

Site means any parcel or combination of contiguous parcels where the proposed land alteration potentially impacts a sensitive area.

Slope means an inclined earth surface, the inclination of which is expressed as the ratio of horizontal distance to vertical distance.

Steep Slope Hazard Areas mean any ground that rises at an inclination of 40% or more within a vertical elevation change of at least ten feet (a vertical rise of ten feet or more for every twenty-five feet of horizontal distance). A slope is delineated by establishing its toe and top and is measured by averaging the inclination over at least ten feet of vertical relief.

1. Toe of a slope is a distinct topographic break in slope which separates slopes inclined at less than 40% from slopes equal to or in excess of 40%. Where no distinct break exists, the toe of the steep slope is the lower most limit of the area where the ground surface drops ten feet or more vertically within a horizontal distance of 25 feet.
2. Top of a slope is a distinct, topographic break in slope which separates slopes inclined at less than 40% from slopes equal to or in excess of 40%. Where no distinct break in slope exists, the top of the slope shall be the uppermost limit of the area where the ground surface drops ten feet or more vertically within a horizontal distance of twenty five feet.

Stream means an area where surface waters flow sufficiently to produce a defined channel or bed. A defined channel or bed is an area which demonstrates clear evidence of the passage of water and includes but is not limited to bedrock channels, gravel beds, sand and silt beds, and defined channel swales. The channel or bed need not contain water year-round. For the purposes of this title, "stream" does not include irrigation and drainage ditches, roadside ditches, grass-lined swales, canals, stormwater runoff devices or other entirely artificial watercourses unless they are used by native fishes or streams which have been channelized or culverted.

Stream Report means a report prepared by an applicant's qualified consultant to describe a stream and to characterize its conditions, wildlife, habitat values and water quality.

Stream System means a network of contiguous streams including any portions of a stream enclosed in drainage pipes which connect to stream segments upstream of such drainage pipes.

Structural Diversity means the relative degree of complexity, variety and spacing or pattern of vegetation in a wetland area as indicated by the stratification or layering of different plant communities (e.g. ground cover, shrub layer and tree canopy).

Substrate means the soil, sediment, decomposing organic matter or combination of those located on the bottom surface of a stream or wetland.

Temporary Erosion Control means on-site and off-site control measures that are needed to control conveyance or deposition of earth, turbidity or pollutants during development, construction, or restoration.

Tinaja means a wetland or body of water underlain by impervious material, usually bedrock, and whose primary source of water is from precipitation. A rockpool.

Topsoil means the uppermost strata of soil containing a large percentage of organic materials and which is capable of providing suitable nourishment for vegetation.

Vadose Zone means the surface layers of the soil and earth which may contain shallow water-tables above permanent groundwater areas.

Vegetation means any and all organic plant life growing at, below, or above the soil surface.

Violation means the knowing disregard of any provision of this ordinance or of the authorizing administrative rules, or of any permit, approval or stop work order or any other order issued by a regulatory department.

Watershed means the geographic region within which water drains into a particular aquatic system or other body of water. It is also referred to as a drainage basin.

Watershed Management Plan means a detailed analysis adopted by the Navajo Environmental Protection Administration for a drainage basin which determines the capabilities and needs for runoff accommodation due to various combination of development, land use and structural and non-structural management alternatives. The plan recommends the form, location and extent of quantity and quality control measures which would satisfy legal constraints,

water quality standards, and local standards, and identifies the institutional and funding requirements for plan implementation.

Waters of the Navajo Nation means, for the purposes of this regulation, all waters which are currently used or have been used in the past or may be used in the future for interstate commerce. This includes lakes: rivers, streams, intermittent streams, mudflats, sandflats, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds or wetlands. Waste treatment systems including lagoons and ponds which meet the definition of a wetland in this section are not included as waters of the Navajo Nation.

Wetlands means those areas of the Navajo Nation that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Army Corps of Engineers Regulation 33 CFR 328.3 (1988)). Wetlands generally include swamps, marshes, bogs, shallow open waters, potholes, wet meadows, river overflow channels, and similar areas. Where the vegetation has been removed, significantly altered or when identification is performed at a time of the year when vegetation is normally absent, a wetland shall be determined by the presence or evidence of hydric or organic soil, as well as other documentation of the previous existence of wetland vegetation such as aerial photographs. Wetlands include the entire individual wetland irrespective of property ownership.

Wetland Buffer Area means a naturally vegetated and undisturbed, enhanced or revegetated zone surrounding a natural, restored or newly created wetland that is an integral part of a wetland ecosystem, and protects a wetland from adverse impacts to the integrity and value of the wetland. Wetland buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical, nutrient and toxic pollutants; provide shading to maintain desirable water temperature; provide habitat for wildlife, and protect wetland resources from harmful intrusion.

Wetland Class means descriptive categories of wetland vegetation communities within the wetlands taxonomic classification system found in the U.S Fish and Wildlife Service's Classification of Wetlands and Deepwater Habitats of the United States, FWS/OBS-79/31 (Cowardin et al. 1979). The Classification Scheme uses an hierarchy of systems, subsystems, classes and subclasses to describe wetland types. Eleven class names are used to describe wetland and deepwater habitat types. These include: forested wetland, scrub-shrub wetland, emergent wetland, moss-lichen wetland, unconsolidated shore, aquatic bed, unconsolidated bottom, rocky shore, streambed and reef.

Wetland Delineation means a procedure performed by a wetland specialist to determine the area of a wetland and to define the

boundary between a wetland and adjacent uplands. Delineations are performed according to the 1987 federal manual, as those terms are defined in these regulations.

Wetland Determination means a report prepared by a qualified wetland specialist or department staff that identifies, characterizes and analyzes potential impacts to wetlands consistent with applicable provisions of these regulations. A determination does not include formal delineation.

Wetland Edge means the line delineating the wetland from adjoining uplands or deepwater habitats. The edge is identified by examining the presence (wetland) or absence (upland) of a prevalence of hydrophytic plants, hydric soils, and the water table at or near the surface.

Wetland Functions and Values means the natural beneficial processes performed by wetlands and includes functions which are important in facilitating food chain production, providing habitat for nesting, rearing, and resting sites for aquatic, terrestrial or avian species. Wetlands act as recharge and discharge areas for groundwater aquifers, maintain water quality, moderate surface water and storm water flows and serve as areas for recreation, education, scientific study and aesthetic enjoyment as well as perform other functions including but not limited to those set out in U.S. Army Corps of Engineers regulations at 33 CFR Section 320.4(b)(2)(1988).

Wetland Subclass means the twenty-eight subclass names used in the USFWS wetland classification scheme to distinguish between different types of wetland classes. Subclass names include: persistent, nonresistant, broad-leaved deciduous, needle-leaved deciduous, broad-leaved evergreen, needle-leaved evergreen and dead. The classification system is fully described in the U.S Fish and Wildlife Service's Classification of Wetlands and Deepwater Habitats of the United States, FWS/OBS-79/31 (Cowardin et al. 1979).

Wet Meadow means a palustrine emergent wetland, typically having up to six inches of standing water during the wet season and dominated by meadow emergents such as reed canary grass, spike rushes, bulrushes, sedges, and rushes. During the growing season, the soil is often saturated but not covered by water. Grazed wet meadows frequently have been or are being used for livestock activities.

Wildlife Habitat Conservation Areas means those areas that provide food, protective cover, nesting, breeding or movement for fish and wildlife and with which individual species have a primary association. Wildlife habitat conservation areas include naturally occurring lakes, ponds, wetlands and riparian areas.

Wildlife Report means a report, prepared by a qualified professional, that evaluates plant communities and wildlife functions and values on a site, consistent with the requirements established by this chapter.

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PART 4.0. ENVIRONMENTALLY SENSITIVE AREAS STANDARDS AND CRITERIA

The protection of environmentally sensitive areas on the Navajo Nation is essential, not only for the preservation of irreplaceable ecological functions and to avoid further damage to the ecosystems, but also for the protection of public health, safety and welfare.

In order to maintain the highest functional values possible, Waters of the Navajo Nation need to be kept free from the harmful effects of silt and sediment, organic pollutants and other contaminants. Placement of structures away from aquatic features can also help to ensure building stability and lessen the risk of damage due to erosion and flooding events.

Many changes occur when poorly controlled land use activities result in the alteration of the natural hydrological characteristics of a stream's drainage basin. Removal of vegetation through clearing and grading, and compaction of the soil by the movement of heavy construction equipment greatly reduces the soil's ability to slow and retain stormwater runoff. Absorption and storage potential are further reduced when impervious materials are used in the construction of, driveways, sidewalks and roadways. When wetlands and drainage ways are filled and eliminated the problem is greatly exacerbated.

Special care must be given to the remaining streams and creeks to keep them free from silt and sediment in critical spawning grounds. and to restrict the removal of streamside vegetation. Harmful contaminants must be controlled from entering critical waters through maintenance of riparian vegetation which also provides critical feeding, resting, and nesting habitats for area wildlife.

By definition, wetlands occupy the transition zone between land and water. Due to this close association with deepwater habitats, the boundary between wetlands and other bodies of water is sometimes indistinguishable. Therefore, the definition of Waters of the Nation and the establishment of regulations for streams, lakes and riparian zones within this regulation is meant to provide protection for those closely associated wetlands. These definitions will not necessarily be used by all departments within the Navajo Nation.

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SECTION 4.1. WATERS OF THE NAVAJO NATION

For the purposes of this regulation, Waters of the Navajo Nation shall be defined as (From Army Corps of Engineers Regulation 33 CFR 328.3 (1988)):

1. All waters which are currently used or were used in the past, or may be susceptible to use in the future for interstate or foreign commerce;

2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
4. All impoundments of waters otherwise defined as waters of the Navajo Nation under the definition;
5. Tributaries of waters identified in paragraphs 1 through 4 above;
6. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1 through 5 above.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Federal Clean Water Act and which also meet the criteria of this definition are not considered waters of the Navajo Nation.

4.1.1. CLASSIFICATION SYSTEM

Aquatic features within the Navajo Nation are divided into four primary categories based on physical characteristics: lakes, rivers and streams, wetlands, and riparian areas. Each of these classifications is given special protection status within this Chapter providing buffers, building setbacks and allowable alterations.

SECTION 4.2. STREAM STANDARDS AND CRITERIA

A typical result of hydrological changes to a drainage system is that a formerly peaceful meandering stream with ample floodplains will develop tremendous scouring and erosive capacity during storm events. This is most acute when floodplains are lost and water storage capacity is reduced. Where banks are eroded and washed away, attempts to armor stream sides with riprap or other bank hardening materials are sometimes made. Such measures usually only exacerbate the problems of scouring and channelization downstream.

Valuable fish spawning and rearing areas are destroyed when they are covered with silt that has been carried along in the torrent. Heavy pollutant loads during high discharge periods may cause actual fish kills and, once lost, fish runs are difficult to restore.

4.2.1. PROTECTION GOALS

Specific stream protection goals include the following:

1. Encourage preservation of all stream systems in their natural condition.
2. Ensure that all streams are specifically identified in the field and accurately located on development plans.
3. Allow stream relocation only when the relocation results in improved stream habitat.
4. Discourage the placement of streams in culverts except for necessary property access and circulation. Bridges and bottomless arch culverts are preferable to culverts where crossings are required.
5. Encourage bioengineering solutions to stream bank protection such as planting vegetation along eroding banks and discourage use of in-stream structures. Whenever it is practical non-structural solutions should replace the traditional use of rip-rap and other bank hardening measures.
6. Promote design of all in-stream structures, including stream crossings, that maintains wildlife and fish habitat and accommodates fish passage.
7. Promote construction of roads and utility corridors on upland sites to avoid stream crossings whenever possible.
8. Require any new development to provide access points for multiple uses when stream crossing is unavoidable.
9. Discourage alteration of the floodplain of streams so as to minimize flood-related damage. Provide compensatory storage for unavoidable impacts to floodplains.

4.2.2. STREAM EDGE DETERMINATION

The delineation of streams shall be made by measuring the stream channel from the ordinary high water mark on one stream bank to the ordinary high water mark on the opposite bank.

4.2.3. STREAM CLASSIFICATION SYSTEM

The following stream classification system will be used (under conditions of normal rainfall) in this regulation for the protection of stream associated wetlands. Intentionally created streams are exempt unless they were created for mitigation purposes.

4.2.3.1. Category I Streams

Category I streams are those natural streams which have a mean annual flow greater than twenty cubic feet per second (20 cfs). The Category I designation applies to all segments of the following waterbodies lying within the boundaries of the Navajo Nation: San Juan River, Little Colorado River, Chaco River and the Colorado River regardless of flow or usage designation.

4.2.3.2. Category II Streams

Category II streams are those natural, perennial, intermittent or ephemeral streams which:

1. Have a mean annual flow less than 20 cfs; and
2. have a defined channel 20 feet or greater in width between ordinary high water marks; or
3. those that are used by fish for spawning, rearing, or migration; or
4. have a human high use and are important from a water quality standpoint for domestic water supplies, public recreation; or
5. are highly significant to protect downstream water quality.

4.2.3.3. Category III Streams

Category III streams are those natural, perennial, intermittent or ephemeral waters not classified as Category I or II streams and which:

1. Have a mean annual flow greater than 0.5 cfs; and
2. are greater than two feet wide between the ordinary high water marks; or
3. are highly significant in their influence on water quality downstream in Category I and II streams; but
4. do not contain resident fish populations.

4.2.3.4. Category IV Streams

Category IV classification is applied to all streams not classified as Category I, II, or III. Included in this classification are areas of perennial or intermittent seepage and drainage ways having short periods of spring or storm runoff.

4.2.4. DEVELOPMENT STANDARDS

Some of the most acute impacts from development in the basin occur during project construction when the ground is bare and permanent drainage controls have not yet been installed. Clearing and shaping the land during construction or development alters surface drainage patterns, causing erosion and siltation and impacting water quality and fisheries resources. In addition, uncontrolled erosion and sediment often cause considerable economic damage to individual residences and public facilities such as roads and bridges.

Clearing and grading are generally the first steps in site alteration. Careful planning and review must begin at this point in order to reduce undesirable impacts to aquatic systems and the entire hydrological regime. Clearing and grading actions that respect the existing terrain and drainage patterns and that remove only the amount of vegetation necessary to accommodate facilities and structures will result in less impact to aquatic systems.

Installation of temporary erosion control measures during the site preparation and construction phase of project development is necessary to protect adjacent aquatic resources. Use of temporary settling ponds for routing of storm-water run-off may be necessary to avoid siltation of receiving bodies of water. Vegetated buffers left as corridors between road and utility construction and aquatic systems play an additional role as permanent erosion control devices for non-point road run-off.

4.2.4.1. Alterations

No alteration of a stream or its buffer or associated floodplain shall be permitted unless the Navajo Water Resources Department, Navajo EPA and the Navajo Fish and Wildlife Department grants an exception pursuant to Section 1.5 or the project involves one of the following areas:

1. Utility lines;
2. Bridge construction and culvert installation;
3. Bank protection devices and flood protection structures, including flow control structures;
4. In-stream fish and/or wildlife habitat enhancement measures;
5. Activities and mitigation authorized by this Chapter including stream restoration, enhancement and relocation.

In addition, the project must follow the prescribed sequencing of mitigation as outlined in Appendix F. Any permitted alteration to a stream course or its buffer shall comply with the requirements of

this regulation and shall require an authorized Hydraulic Alteration Notification (HAN).

Stream Crossings. Category I streams shall not be altered (unless specifically excepted for bridge crossings). Stream crossings may be allowed for other category streams if all reasonable construction techniques and best management practices are used to avoid disruption to the stream bed or bank. Upon completion of construction, the area affected shall be restored to an appropriate grade, replanted with native species and/or otherwise protected according to a plan approved by the Navajo Water Resources Department, Navajo EPA and/or Navajo Fish and Wildlife Department and maintained and monitored per the requirements of Appendix H.

Construction practices which avoid streams and wetlands wherever possible, minimize stream and wetland crossings when crossings are necessary and respect natural drainage ways can prevent future stream losses. Proper design includes stream crossings which are consistent with standard engineering requirements and retention of buffers and other run-off and drainage controls. Such measures will help to ensure the health of the Navajo Nation's aquatic systems and the perpetuation of valuable wildlife and fish habitat.

Stream Crossing BMPs. For all categories of streams, the applicant must demonstrate that best management practices will be used during construction to provide protection for water quality, associated wetlands, fisheries protection and protection for fish migration or spawning. Refer to Appendix C for stream crossing BMPs.

Stream Relocations. Relocation of a stream to provide greater reasonable access to an area shall only be authorized under the following conditions:

1. Category I Streams shall not be relocated.
2. Category II Streams shall not be relocated except for road projects which have been authorized by the exception process defined in Section 1.5.
3. Category III Streams may be relocated under a mitigation plan for the purpose of enhancement of in-stream resources provided all appropriate floodplain protection measures are used, and the requirements of this regulation are met.
4. Category IV Streams may be relocated under approval of the Navajo Fish and Wildlife Department and Navajo EPA.

4.2.5. STREAM BUFFERS

Buffers for streams shall be measured on each side of the stream, from the top of the bank. The following are the standard buffers for streams:

1. All Category I streams and those Category II streams with resident fish populations shall have a 200 foot buffer.
2. Category II streams without fish shall have a 100 foot buffer.
3. Category III streams shall have a 50 foot buffer.
4. Category IV streams shall have a 25 foot buffer.

4.2.6 WATER QUALITY

In order to provide for adequate water quality protection for all aquatic systems, drainage concepts and facilities design should encourage the use of approved methods of maintaining acceptable water quality prior to waste water discharge into natural systems. The use and placement of retention/detention facilities within identified aquatic systems or their buffers should be carefully reviewed prior to approval to ensure that no damage will occur to the system and that any changes that could occur to the system are determined to increase the system's functional values.

This regulation shall implement the water quality standards, including water quality standards for wetlands, set forth in the Navajo Water Quality Code developed by the Navajo EPA pursuant to the Water Quality Standards Regulation 40 CFR 131.11(a)(1) in accordance with Sections 305(b), 402, 404, 401 and 319 of the Clean Water Act.

SECTION 4.3. LAKE AND RELATED FEATURES STANDARDS AND CRITERIAS

4.3.1. PROTECTION GOALS

Specific lake protection goals include, but are not limited to the following:

1. Encourage retention of wetlands associated with lakes. Restrict filling and draining of these wetlands because of their value as filters for water quality maintenance and for provision of breeding, spawning, and rearing habitat for a wide variety of plant and animal life, and for their water holding capacity.
2. Avoid any development within the 100-year floodplain of any lake.
3. Design, locate, and maintain access to lakes so as to protect the natural environment and the natural process.

4. Promote shared access to lakes, especially the placement of structures which intrude in the lake, so that access is maintained but with minimal impacts.
5. Allow access points which are constructed on raised pilings or consist of floating structures through wetlands to lake waters. Access through wetlands should only be allowed when upland access points are unavailable.
6. Encourage the retention of naturally vegetated buffers on all lake shores.

4.3.2. FUNCTIONS AND VALUES

True lakes are extremely rare on the Navajo Nation. Virtually all bodies of water which are defined as a lake under these regulations (see Section 3.0) have either been enhanced or modified to some degree or are entirely artificial. The majority of the standing water bodies within the Nation are small, seasonally-flooded, man-made stock watering ponds. Lakes serve many of the same functions as streams and wetlands in provision of valuable habitats, discharge/recharge, erosion prevention and recreation. In addition, lakes support some of the most valuable wetlands on Navajo land.

In natural systems, lakes exhibit a slow natural progression from deep, clear, low-productivity waters through shallow, turbid water with high levels of productivity and, as sediment accumulation continues, eventual development into completely terrestrial environments. This process has been greatly accelerated in many of the lakes and ponds within the Navajo Nation through increased inputs of fertilizers, organic matter and sediments due to intensive land use activities such as grazing, agriculture and logging. As a scarce resource, it is imperative to develop specific standards and regulations which will reduce sedimentation, improve water quality and maintain useability of lakes on the Navajo lands.

4.3.3. LAKE AND RELATED WATERS CLASSIFICATION SYSTEM

For the purposes of this Chapter the following system will be used for the classification of lakes and related bodies of water for the purposes of associated wetland protection.

4.3.3.1. Lakes and Ponds

As defined in Section 3.0 a lake means any naturally existing or artificially created body of standing water, including reservoirs, which exists on a year-round basis and occurs in a depression of land or expanded part of a stream. To be classified a lake, a body of water must be larger than one acre in size, greater than 2 meters (6.6 feet) in depth at the deepest point, and have less than

30% areal coverage by trees, shrubs, or emergent vegetation. A lake is delineated by the ordinary high water mark and, where a stream enters the lake, the extension of the elevation of the lake's ordinary high water mark within the stream.

4.3.3.2. Playas

As defined in section 3.0 playas are normally dry, closed basin lakes. Evaporation and infiltration are typically the only means of discharge from a playa. Unlike a lake, a playa does not have a size qualification and includes not only the area subject to periodic inundation and but also an area within fifty feet of the normal high water mark.

4.3.3.3. Estangues, Presas, and Represos or Charcos

Man-made freshwater environments such as presas (artificial reservoirs), estangues (farm ponds), and repressos or charcos (cattle tanks) are becoming increasingly important and far more numerous than natural pond features of the Southwest. Typically these constructed impoundments are built in natural drainage systems and as such are now replacing the historical stream habitats.

4.3.4. LAKE ALTERATION

No alteration to natural lakes, tinajas, cienagas, adjacent wetlands and riparian zones or associated buffers shall be allowed.

Artificially constructed impoundments and cattle tanks may be amended provided alteration does not adversely impact natural aquatic features as defined by this regulation.

4.3.5. LAKE BUFFERS

A minimum 200 foot buffer shall be retained for all unvegetated lakes and shall be measured from the Ordinary High Water Mark. Lakes with associated wetlands or riparian areas shall retain a buffer consistent with the wetland and riparian buffers set forth in this Chapter.

No alteration shall be allowed within the 100-year floodplain of a lake regardless of the established buffers

SECTION 4.4. WETLAND MANAGEMENT STANDARDS AND CRITERIA

As defined in Section 3.0 of this regulation, wetlands means those areas of the Navajo Nation that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in

saturated soil conditions (Army Corps of Engineers Regulation 33 CFR 328.3 (1988)). Wetlands generally include swamps, marshes, bogs, shallow open waters, potholes, wet meadows, river overflow channels, and similar areas. Where the vegetation has been removed or significantly altered, a wetland shall be determined by the presence or evidence of hydric or organic soil, as well as other documentation of the previous existence of wetland vegetation such as aerial photographs. The rating of a wetland is determined by evaluating the entire individual wetland in question irrespective of property boundaries, ownership or land uses.

All wetlands as defined in this section and delineated per the federal manual and subsequent United States Army Corps of Engineers regulatory guidance letters, will be regulated by the department. In addition, although a site-specific wetland may not meet the criteria described above, it will also be considered a regulated wetland if it is functionally related to a wetland that meets the criteria.

4.4.1. PROTECTION GOALS AND POLICIES

The goals of wetland protection include, but are not limited to, the following:

1. Assure no net loss of wetland area or functional values and institute a program for the overall long-term net gain of wetland functions and values.
2. Encourage that all wetlands irrespective of size and value be preserved in their natural condition.
3. Allow wetland alteration only after it has been demonstrated that no other reasonable design alternative exists or that other reasonable alternatives are less desirable and when mitigation is provided that adequately compensates for lost functional values.
4. Ensure that all wetlands are specifically identified in the field and accurately located on site development plans.
5. Maintain the important natural functions of all wetlands.
6. Alterations of wetlands through grazing, clearing, grading, draining and filling should be discouraged.
7. Promote the construction of roads and utility corridors on upland sites to avoid wetland crossings and disturbance.

4.4.2. WETLAND DELINEATION

The Corps of Engineers Wetlands Delineation Manual (1987) shall be used for conducting wetland delineations in fulfillment of the

requirements of this regulation. Data collected shall be recorded on a standard Wetland Determination Field Data Form (Appendix I) during a delineation effort and shall be included as part of the wetland study requirements (Appendix E).

4.4.3. WETLAND CLASSIFICATION SYSTEM

The terms class and wetland class are based on the U.S. Fish and Wildlife Classification System of wetlands based on vegetative communities. Wetlands subject to alteration must be evaluated in the field using the Wetland Evaluation Field Data Form (Appendix I).

Category I Wetlands means those ecologically significant wetlands that are rare on the Navajo Nation and perform irreplaceable ecological functions or are listed as Category I Wetlands on the Navajo Nation Wetland Inventory Map (in process). These wetlands may be impossible to replace and therefore cannot afford the risk of any degradation. Class I Wetlands are those which:

1. Are verified through a database search as being utilized by species recognized to be endangered, threatened or sensitive by the Navajo Natural Heritage Program or the U.S. Fish and Wildlife Service, or the presence of critical or outstanding habitat for those species, or sites that are documented or qualify as Natural Heritage wetlands; or
2. Contain plant associations of rare or infrequent occurrence or a unique or rare habitat type for Navajo Lands. Those habitats are limited to wetlands containing peat, or climax community forested wetlands, or tinajas, or cienagas; or
3. Have a significant habitat value and diversity as demonstrated by the following characteristics: a wetland of any size having 40% to 60% of the total wetland area in permanent open water in dispersed patches with two or more subclasses of vegetation as identified per the U.S. Fish and Wildlife Service wetland classification system; or
4. Contains a high level of structural diversity as evidenced by the presence of at least two types of the following special habitat features:
 - a. fish rearing areas as demonstrated by the presence of juveniles,
 - b. snags,
 - c. trees with dead and dying tops,
 - d. rocky outcroppings,
 - e. islands suitable for nest sites,
 - f. nest colonies of protected species, and
 - g. large downed woody debris; or

5. Are equal to or greater than five (5) acres in size and have 3 or more wetland subclasses as identified by the U.S. Fish and Wildlife Service wetland classification system, one of which is open water; or
6. Is classified Category I in the Wetlands Rating Field or Office Data Form.

Category II Wetlands means those wetlands which display significant ecological functions and values that may not be adequately replicated through creation or restoration and those wetlands that meet any of the following criteria:

1. Perform important ecological functions but which do not meet the definitional criteria for Class I wetlands; or
2. Are assigned Wetland Category II in the Navajo Nation Wetlands Inventory Map (in process); or
3. Receive a score greater than twenty one (21) on the Wetland Field Rating Form evaluation procedure established in Appendix K of this regulation; or
4. Riparian wetlands which do not meet the definitional criteria for Class I wetland in this Section shall in all cases be class II wetlands.

Category III Wetlands are generally smaller, less diverse and/or more isolated than Category II wetlands. They occur most frequently of all wetland classes, are difficult to replace and need a moderate level of protection. Category III wetlands are those wetlands which:

1. Are of lesser habitat value than Category I or II wetlands as evidenced by the lack of food plants for wildlife; and
2. Are characterized by monotypic vegetation of similar age class; and
3. Lack of open water areas and special habitat features; and
4. Are hydrologically isolated from other aquatic systems (lacking either surface or subsurface connections), or;
5. Are designated as Category III on the Navajo Nation Wetland Inventory Map (in process); or
6. Receive a score of twenty one (21) or less on the Wetlands Field Rating Form established in Appendix K of this regulation.

Category IV Wetlands means those areas which meet the technical definition of a wetland according to the federal manual but are entirely artificial and have been purposefully and intentionally created from non-wetland sites by human actions, including but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities.

Category C Wetlands means any wetland designated as culturally significant or religiously valuable by a motion of the Navajo Council. Category C wetlands are granted protection status, buffers and setbacks, identical to Category I wetlands.

Farmed Wetlands are jurisdictional wetlands that have been in continuous agricultural crop production prior to five years before acceptance of this regulation. Agricultural crop production is limited to lands intensively managed for food production and does not include range land, forest land and tree farms. Farmed wetlands (also called prior converted croplands) are not subject to the provisions of this regulation.

Cienagas are spring-fed marshlands of the Southwestern United States, essentially equivalent to a mire. During the last century, cienagas have experienced dramatic changes across the southwest with the majority being drained or pumped dry. Because of their unique habitat values, all cienagas within Navajo Lands will be specifically identified within this document and will be inventoried as Category I Wetlands regardless of present functional values. Hugo Meadows currently the only cienaga identified on Navajo Land.

A tinaja is a wetland or body of water underlain by impervious material, usually bedrock, and whose primary source of water is from precipitation. Sometimes defined as a rockpool, all tinajas will be considered Category I wetlands.

4.4.4. DEVELOPMENT STANDARDS

Alterations to wetlands, cienagas or tinajas and their buffers shall only be allowed pursuant to the provisions of Section 4.4.4.1. Any authorized alteration of a wetland must follow the prescribed sequencing of mitigation as outlined in Section 4.4.6 of this ordinance. Impacts to wetlands or their buffers shall be compensated for at the replacement ratios specified in Sections 4.4.6, and pursuant a compensatory mitigation plan as required within Section 4.4.6.1.

In some cases engineering solutions may be required to replace functions such as soil permeability and groundwater storage which are lost when impervious surfaces replace natural soil and vegetative cover. Such systems should be designed to mimic the functions of natural systems as much as possible.

Land development can be compatible with the goal of protecting aquatic systems if the projects are designed with the purpose of retaining and protecting stream corridors and wetland areas to the greatest extent possible.

4.4.4.1. ALTERATIONS

Alterations to wetlands and/or their buffers may be permitted by the Navajo EPA subject to the following criteria. Where impacts cannot be avoided, the applicant shall provide appropriate mitigation in compliance with the standards and intent of this Chapter. In all instances, there shall be no net loss of wetland function, value or acreage due to the alteration.

Filling of Wetlands. Filling of less than one-half acre of any category wetland may be allowed pursuant to the restrictions set forth in this Chapter and the conditions listed below and upon Navajo EPA approval of an appropriate mitigation plan. Filling of between one-half and one acre will require a special written filling permit. In no instance shall filling of more than one acre of wetland be allowed.

Wellhead Protection. All wetlands located within a defined wellhead protection area shall receive Category I wetland protection status.

Category I and II Wetlands. No alteration to Category I, Category II or Category C wetlands shall be authorized unless as exempted within Section 1.5. Category I, II and C Wetlands and their buffers shall not be used for livestock watering or grazing, effluent disposal, or stormwater management purposes including engineered retention/detention or constructed biofiltration features. Conveyance of pre-treated stormwater may be allowed to pass through the buffer into the Category 1 Wetland if the manner of conveyance imitates that found in the natural condition, i.e. infiltration and/or sheet flow.

Category III Wetlands. No alterations to Category III Wetlands larger than one acre shall be authorized unless exempted within Section 1.4. Category III Wetlands shall not be used for the treatment of water for water quality.

Category IV Wetlands. Artificially created wetlands may be altered upon written notification (for tracking purposes) to the Department. Category IV Wetlands may be used to mitigate impacts to other category wetlands.

4.4.5. WETLAND BUFFERS

Buffer conditions shall prohibit or limit the removal or alteration of existing vegetation in the buffer areas as necessary to preserve the functions of the wetland. Any disturbance of the buffer areas

shall be replanted with a diverse plant community of native vegetation appropriate for the site and approved by the Navajo Fish and Wildlife Department.

Buffer requirements may be increased in individual cases, depending on site specific conditions as determined by the Department. Buffers shall be measured from the wetland edge as delineated and marked in the field using the Federal Methodology.

Low-impact uses and activities such as pedestrian trails, viewing platforms, outdoor scientific or educational uses, utility easements and utilities installations which do not detract from the buffer integrity may be permitted.

The following buffer widths shall be established for wetlands based on the category of wetland as outlined in Section 4.4.3.

Category I	200 feet
Category II	150 feet
Category III	100 feet
Category IV	50 feet
Category C	200 feet

4.4.6. MITIGATION

Compensatory Mitigation. As a condition of any permit allowing alteration of a sensitive area or its buffer, or as an enforcement action pursuant to Section 4.7, the Department shall require that the applicant provide compensatory mitigation in the form of restoration of the sensitive area and its buffer or creation of a new sensitive area and buffer in order to offset the impacts resulting from the applicant's or violator's actions. The minimum overall goal of compensatory mitigation shall be no overall net loss of wetland function, value or acreage and the restored, created or enhanced wetland will be as persistent and sustainable as the wetland it replaces. Mitigation should be encouraged which would result in an overall net increase of wetland function and value within the Navajo Nation.

Enhancement of existing significantly degraded wetlands, streams or lakes may be considered for potential partial compensation. When enhancement of an existing significantly degraded wetland or stream is proposed as compensation for the loss of existing functional wetland or stream, the replacement ratios as provided within Section 4.4.6 shall be doubled. Compensation shall be completed prior to wetland or stream alteration, where possible.

Replacement Ratios. Any person who alters or proposes to alter a wetland or its buffers shall restore or create equivalent or greater areas of wetland or buffer than those altered in order to compensate for wetland or buffer losses. The following ratios apply to creation or restoration which is in-kind, on-site, and

timed prior to or concurrent with alteration. These ratios do not apply to remedial actions resulting from illegal alterations. The first number specifies the acreage of wetlands requiring replacement (created) and the second specifies the acreage of wetlands altered (lost).

Category I:	6:1
Category II:	3:1
Category III:	2:1
Category IV:	0.5:1
Category C:	no alteration allowed

The Navajo EPA may increase these standards where mitigation is to occur off-site, or in other appropriate circumstances.

Mitigation Sequence. As defined in this Chapter mitigation includes avoiding, minimizing or compensating for adverse impacts to a sensitive area or its buffer. When a proposed development activity poses potential adverse impacts to a sensitive area or its buffer the following prioritized sequence of mitigation shall be followed:

1. Avoid the impact altogether by not taking a certain action or parts of an action;
2. Minimize impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
3. Rectify the impact by repairing, rehabilitating or restoring the affected environment;
4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action;
5. Compensate for the impact by replacing, enhancing, or providing substitute resources or environments, and;
6. Monitor the impact and the compensation project and taking appropriate corrective measures.

Location and Timing of Mitigation. The following prioritized steps of mitigation implementation shall be followed:

1. Mitigation shall be provided on-site, except where on-site mitigation is not scientifically feasible or practical.
2. When mitigation cannot be provided on-site, mitigation shall be provided in the immediate vicinity of and within the same watershed as the permitted activity.

3. In-kind mitigation shall be provided.
4. Out-of-kind mitigation shall be permitted only when 1, 2 or 3 above cannot be met. Out-of-kind mitigation will require increased replacement ratios.

4.4.6.1. MITIGATION PLAN REQUIREMENTS.

Where it is determined by the Navajo EPA or Navajo Fish and Wildlife Department that compensatory wetland mitigation is required or appropriate, a mitigation plan shall be prepared. The purpose of the plan is to prescribe mitigation to compensate for the impacts to the wetlands functions, values and acreage as a result of the proposed action. This plan shall include chemical, physical, and biological impacts on the wetland system using a recognized wetlands assessment methodology or best professional judgement. See Appendix F for specific mitigation plan requirements.

4.4.6.2. MITIGATION PLANNING BEST MANAGEMENT PRACTICES

Wetlands require adequate supplies of water for survival. Establishment or expansion of wetlands should be encouraged in areas of natural groundwater discharge or shallow water table. A list of mitigation BMPs are provided in Appendix G.

On completion of construction, the wetland mitigation project must be signed off by the applicant's representative and by the Navajo departments involved. Signature will indicate that the construction has been completed as planned.

4.4.6.3. MONITORING PROGRAM AND CONTINGENCY PLAN

A monitoring program shall be implemented to determine the success of the mitigation project and any necessary corrective actions. This program shall determine if the original goals and objectives are being met. The following standards will be used in the formulation of a monitoring plan:

1. During monitoring, use scientific procedures for establishing the success or failure of the project;
2. For vegetation determinations, permanent sampling points shall be established;
3. Vegetative success equals 80 percent per year survival of planted trees and shrubs and 80 percent per year cover of desirable understory of emergent species;
4. An annual monitoring report based on the entire year of monitoring shall be submitted to the department by September 30 of each year. The reports are to include monitoring

information on wildlife, vegetation, water quality, water flow, stormwater storage and conveyance, and existing or potential degradation and shall be produced on the following schedule:

- a. At time of construction;
 - b. Mid-season in the growing season of each consecutive year following installation;
5. Monitor between 3 and 5 growing seasons, depending on the complexity of the wetland system. The time period will be determined and specified in writing prior to the implementation of the site plan;
 6. If necessary, correct for failure in the mitigation plan;
 7. Replace dead or undesirable vegetation with appropriate plantings;
 8. Repair damages caused by erosion, settling, or other geomorphological process;
 9. Redesign mitigation project (if necessary) and implement the new design; and
 10. Correction procedures shall be approved by the Department before implementation.

A contingency plan shall be established for compensation in the event that the mitigation project is inadequate or fails. A bond or other acceptable security device is required to ensure the applicant's compliance with the terms of the mitigation agreement.

4.4.7. SENSITIVE AREAS STUDY

When an application for a development proposal on a site that includes, is adjacent to, or could significantly impact a sensitive area is received, Navajo Fish and Wildlife/Navajo EPA shall require the preparation of a Sensitive Areas Study by a qualified consultant. Staff shall make a determination whether the development proposal includes, is adjacent to, or faces potentially significant impacts to a Sensitive Area or its buffer.

Waivers. When staff determines, based on preliminary field investigation, and the review of technical information available that:

1. There will be no alteration of the sensitive area or its required buffers pursuant to the requirements of this Chapter;

2. The development proposal will not impact the sensitive area in a manner contrary to the goals, purposes, objectives and requirements of this Chapter; and
3. The development proposal meets the minimum standards of this Chapter; then
4. The Staff may waive the requirement for a detailed Sensitive Areas Study.

In no case may staff waive the need for a Compensatory Mitigation Plan if sensitive areas impacts are identified.

Contents. When it is determined by the responsible staff that a Sensitive Areas Study is required for a development proposal, the minimum criteria for study content which is specific to each sensitive area type will be required. Minimum criteria and report guidelines are provided in Appendix E. When proposing compensatory mitigation designs, additional detailed studies may be required.

SECTION 4.5. RIPARIAN CORRIDOR MANAGEMENT PLAN

- 4.5.1. PROTECTION GOALS
- 4.5.2. FUNCTIONS AND VALUES
- 4.5.3. RIPARIAN CLASSIFICATION SYSTEM
 - 4.5.3.1. Categories
 - 4.5.3.2. NWI and Aerial photos

SECTION 4.6. MANAGEMENT OF GEOLOGIC HAZARDS IN AQUATIC SYSTEMS

Provisions of this Section shall apply to all proposals for development on land containing a geologic hazard within 200 feet of an aquatic resource as defined in Section 3.0.

Geologically hazardous areas are those areas on the Navajo Nation which because of their susceptibility to erosion, landsliding, or other geological events, are not suited to siting commercial, residential, or industrial developments. These areas are may also be characterized by geologic and hydrologic conditions that make them vulnerable to contamination of groundwater supplies through infiltration of contaminants to aquifers. Geological hazards cover the following categories: erosion, landslide, flood, coal mines and steep slopes.

4.6.1. PROTECTION GOALS

The goals of protecting geologic hazards in aquatic systems include but are not limited to:

1. Prevention of the loss of fish and wildlife habitat due to mass movement of sediments into aquatic systems.
2. Reduction in the rate of wetland and lake loss due to sediment inputs.
3. Water quality maintenance.
4. Protection of property, life and health.

4.6.2. ALTERATIONS TO GEOLOGIC HAZARDS

No alteration of an area of potential geologic instability or its buffer shall be allowed unless the Navajo EPA grants an exception per Section 1.5 or it finds:

1. There is no evidence of past instability or earth movement in the vicinity of the development proposal and quantitative analysis of slope stability presented by a qualified geotechnical consultant indicates no significant risk to the development proposal or adjacent properties; or
2. The area of potential geologic instability can be modified or the project can be designed so that any potential impact to the project or adjacent properties is eliminated or mitigated and the development proposal is certified as stable by a licensed geologist or geotechnical engineer. The development proposal should cause no increase in surface water discharge or sedimentation and should not decrease slope stability.

4.6.2.1. Erosion Hazard Areas

Alterations within identified Erosion Hazard Areas shall not be authorized without an approved Erosion Control and Sedimentation Plan (ECSP) which includes staged clearing where appropriate. Clearing or disruption of the soils within an erosion hazard area shall be kept to the minimum necessary. Development activities below the base flood elevation shall not be permitted.

4.6.2.2. Flood Hazard Areas.

Development proposals shall not reduce the effective base-flood storage volume of the floodplain.

4.6.2.3. Coal Mine Hazard Areas

Alteration of a site containing a coal mine hazard area may be permitted only when all significant risks of surface water or groundwater contamination have been eliminated or mitigated so that the site is as safe as a site which has not been previously mined.

Wetlands created as a result of coal mining activities may be filled or altered sufficient to reduce conditions which are determined to be potentially hazardous to human life or health.

4.6.2.4. Landslide Hazard Areas

Landslide hazard areas located on slopes less than 30% and within 200 feet of an aquatic resource shall only be approved to be altered if both of the following provisions are met:

1. The proposed development will not decrease slope stability on any adjacent property; and
2. The landslide hazard to the project and adjacent property is eliminated or mitigated.

4.6.2.5. Best Management Practices

Any authorized alteration of a geologically hazardous area shall meet the BMPs described in Appendix D.

4.6.2.6. Steep Slope Hazard Areas

No development or alteration shall be allowed in steep slope hazard areas unless an exception is approved pursuant to Section 4.5.

4.6.3. GEOLOGIC HAZARD BUFFERS AND SETBACKS

Buffers for geologically hazardous areas shall be 50 feet in width, beginning at the edge of the defined geologic hazard and shall be maintained with their natural, native vegetation.

SECTION 4.7. VIOLATION AND PENALTIES

Any development activities, environmental alterations or other actions in violation of the provisions of this regulation will be considered a non-conformance/non-compliance and will be subjected to an immediate stop work order. Subsequent to stop work issuance, a sensitive areas study/report of the site will be mandated. The report will detail a mitigation, monitoring plan and contingency plan. Site restoration and mitigation will be implemented prior to approval for resumption of development activities. Sensitive areas study, mitigation plan development and plan implementation will be at violators expense.

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PART 5.0. NAVAJO NATION WATERSHED INVENTORY

According to the Hydrologic Unit Maps produced by the United States Geological Survey (USGS), the two river drainages of the Navajo Nation are divided by three primary regional boundaries: the Upper and Lower Colorado Regions west of the continental divide and the Rio Grande Region east of the divide. These regions are sub-divided into the Upper Rio Grande River, Glen Canyon, the San Juan River, Grand Canyon, the Little Colorado River and the Verde River Valley subregions. Thirty individual watersheds are identified by the USGS within the subregion boundaries with finer divisions of the watersheds into basins and sub-basins made by the Navajo Environmental Protection Administration staff to facilitate resource inventory field work. A watershed management plan will be developed for each watershed and will contain a detailed assessment of existing conditions, existing and potential impacts and rehabilitation potential.

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PART 6.0. ATTACHMENTS

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APPENDIX A. SEQUENCE OF ACTIONS FOR WETLAND PROJECT REVIEW

1. A wetland review will be included as a part of the overall project plan review and will be performed at the same time as the review for impacts to threatened and endangered species. It is **not** the intention of the wetland protection program to create another step in the review process.
2. It is preferable for the proponent to discuss the project with the Fish and Wildlife reviewer prior to formal plan submittal in order to avoid inclusion of wetland areas in the initial and/or final plan design. This will reduce conflicts later and may eliminate the need for a formal wetland review.
3. It is the responsibility of the project proponent to perform a check of the National Wetland Inventory Maps (NWI) prior to development of final project plans. NWI maps are available at the Fish and Wildlife Office for public review. Fish and Wildlife Staff are available to assist in map interpretation. A copy of the portion of the NWI map containing the proposed project site must accompany all correspondence with the Fish and Wildlife project reviewer. It is our goal to avoid or minimize delay of project acceptance due to wetland conflicts whenever possible.
4. Due to the inherent inaccuracy of the NWI maps, if a proposed project site is within 0.25 miles of an NWI wetland then it will be considered to have an impact on that wetland and will require further analysis. However, if according to the NWI, it is determined that the project will not impact Navajo Nation wetland resources then approval may be granted prior to formal plan review and no further action will be necessary.
5. If it is determined from a review of the NWI maps that a wetland may be disturbed, then a Sensitive Areas Identification Key (Appendix B, attached) must be completed. Depending on the conclusions derived in the identification key a Wetland Determination Field Data Form (Appendix I) and/or a Wetlands Field Rating Form (Appendix K). It is encouraged that the identification key be prepared as soon as possible in order to identify potential problems and to solve those problems before final project design and plan submission. Completion of the key requires a site visit but does not necessarily require the use of a qualified wetland biologist. This is a self-guided key and will help you determine if a sensitive area is located on or near the property in question.
6. At any time during this preliminary phase, consultation with the project reviewer from the Fish and Wildlife Division is encouraged. Avoidance of wetland disturbance and the prevention of unnecessary project delay or increased costs are the primary objectives of this process.

7. At this point if it is determined that wetland disturbance cannot be avoided then the following attached documents must be prepared and submitted with the project plan (to be done in this order):

- a. Routine Wetland Determination Data Form.
- b. Wetlands Rating Office Form.
- c. Wetlands Field Rating Form.
- d. Wetlands Technical Report. (Preparation of the wetlands technical report must be performed by a qualified wetland biologist.)
- e. Preparation of a Temporary Erosion Control Plan.
- f. Preparation of a Wetlands Mitigation and Monitoring Plan which will include performance standards and a contingency plan.

8. All wetland reports and plans must be completed and approved by the Fish and Wildlife Division before work in a sensitive area will be allowed to begin.

9. Refer to the Navajo Nation Aquatic Resource Protection Plan for specific regulations governing allowable activities within sensitive areas, definitions, buffers, setbacks, Best Management Practices and other requirements. A final sensitive area review will be performed at this time to ensure that impacts to sensitive areas have been adequately addressed.

10. Avoidance of impacts to wetlands and other sensitive areas should be the first action considered and is the best way to protect the environment of the Navajo Nation, save time and project costs and prevent general discombobulation among all concerned.

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APPENDIX B. SENSITIVE AREA IDENTIFICATION KEY

Use the following as you would any dichotomous key to direct you to the pertinent section(s) of this regulation. You must read both of the leads of each step. In all cases all areas to be altered must be surveyed for the potential location of Fish and Wildlife Habitat Conservation Areas.

1. If the land you are concerned with has, or is within 200 feet of, an area containing surface water at any time of the year then GO TO 2.
1. If, during any portion of the year, you have an area, or are within 200 feet of an area, containing vegetation (a plant community) markedly different than the surrounding vegetation and which may or may not be connected to a body of water, then treat the area as a wetland. See Section 4.4 GO TO 11
2. If you have flowing water within a defined channel during any portion of the year then GO TO 3.
2. If the area in question contains a body of standing water for any portion of the year then the site probably contains a "Water of the Navajo Nation." GO TO 8.
3. If the channel contains flowing water year-round then it is a permanent stream see Section 4.2 and then GO TO 4.
3. If the entire length of the channel does not contain flowing water year-round GO TO 6.
4. If the channel bottom is vegetated then this site also contains a riverine wetland. see Section 4.4 and GO TO 5.
4. If the channel is non-vegetated then the site contains a water of the Navajo Nation other than a wetland. See Section 4.1 and GO TO 5.
5. If vegetation along the channel bank is different than the surrounding upland vegetation then the site also contains a riparian zone and/or a riparian wetland. See Section 4.4
5. If vegetation along the channel bank is identical to the surrounding upland vegetation then no riparian wetland is present and no further action is necessary.
6. If the water flows in portions of the channel throughout the year it is an intermittent stream and is considered a "Water of the Navajo Nation". See sections 4.2 and 4.1. GO TO 7.

6. If, for a portion of the year, water does not flow in any section of the channel then it is an ephemeral or temporary stream (dry wash) and is considered a "Water of the Navajo Nation". See section 4.2 and 4.1. GO TO 7.
7. If vegetation within the channel or along the channel bank is different than the surrounding clearly upland vegetation then the site also contains either a riparian wetland and/or a riparian zone. See section 4.4.
7. If vegetation along the channel bank is identical to surrounding upland vegetation then no riparian wetland is present and no further action is necessary.
8. If the body of water remains all year and is larger than 1 acre then it is a lake. If it is smaller than 1 acre then it is a pond. Both are considered "Waters of the Navajo Nation". See sections 4.3 and 4.1. GO TO 9.
8. If the body of water dries up during any portion of the year but leaves a defined lake margin (wave-cut bench, water deposited material etc.) then it is a playa and is still considered as a "Water of the Navajo Nation". See sections 4.3 and 4.1. GO TO 10.
9. If vegetation along the lake or pond margin is different than the surrounding upland vegetation then the site also contains a riparian wetland and/or a riparian zone. See section 4.4.
9. If vegetation along the lake or pond margin is identical to surrounding upland vegetation then no riparian wetland is present and no further action is necessary.
10. If vegetation along the playa margin is different than the surrounding upland vegetation then the site also contains a riparian wetland and/or a riparian zone. See section 4.4.
10. If vegetation along the playa margin is identical to surrounding upland vegetation then no riparian wetland present and no further action is necessary.

11. If this plant community is located in a depressional area and during any portion of the year contains standing water not covering the tops of the plants then it is probably an emergent marsh. See section 4.4.

11. If this plant community is located in an area which is infrequently flooded or the soil is only saturated during a portion of the year (during the majority of the year the soil may be dry) then it is probably a "wet meadow" wetland. See section 4.4.

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APPENDIX C. STREAM CROSSING BEST MANAGEMENT PRACTICES

Stream Crossing BMPs. For all categories of streams, the applicant must demonstrate that best management practices will be used during construction to provide protection for water quality, associated wetlands and fisheries protection, including no interference with fish migration or spawning.

Any or all of the following BMPs may apply to a specific project:

1. Bridges are required for new crossings of any Category I (specific exemption is required) or Category II waters.
2. Excavations for bridge placement shall be accomplished from outside of the ordinary high water mark.
3. All crossings shall be constructed during low flow periods and shall be timed to avoid stream disturbance during periods when stream use is critical to fish.
4. Crossings shall not occur over fish spawning areas unless no other possible crossing site exists.
5. Crossings and culverted portions of the stream shall be minimized to the extent feasible and serve multiple purposes and building sites whenever possible.
6. Roads may cross streams only on previously approved rights-of-way, provided no practical alternative exists and adequate provision is made to protect and/or enhance the stream through appropriate mitigation. Roads shall be designed and located to conform to topography, and maintained to prevent erosion and restriction of natural movement of groundwater as it affects the stream.
7. Roads and utilities shall be designed to minimize the area of disturbance to the stream.
8. Roads shall be constructed so as to minimize adverse impacts on the hydrologic quality of the stream or associated habitat to a degree acceptable to the department.
9. Preparation of specific management plans for temporary sedimentation, erosion control, or other purposes.
10. Where pre-existing flooding and erosion problems require installation of some form of bank protection, use of non-structural bank protection methods is preferable. Such methods include bank vegetation and reestablishment of normal flow patterns. The installation of in-stream structures that serve as energy dissipaters or flow diverters is discouraged.

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APPENDIX C. STREAM CROSSING BEST MANAGEMENT PRACTICES

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7. Roads and utilities shall be designed to minimize the area of disturbance to the stream.
8. Roads shall be constructed so as to minimize adverse impacts on the hydrologic quality of the stream or associated habitat to a degree acceptable to the department.
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APPENDIX D. GEOLOGIC HAZARD BEST MANAGEMENT PRACTICES

Any authorized alteration of a geologically hazardous area shall meet the following Best Management Practices:

1. Clearing vegetation is allowed only within the dry season, generally from April through June and September through October.
2. Only necessary clearing to install temporary sedimentation and erosion control measures for an approved development proposal prior to clearing for roadways, utilities, or storm drainage.
3. Clearing limits for roads, sewer, water, storm-water, or other utilities, and temporary erosion control facilities shall be marked in the field and approved by Department Staff prior to any alteration of existing vegetation or commencement or other site work.
4. Clearing authorized roads and utilities shall be the minimum necessary to accomplish the project and shall remain within the field rights-of-way.
5. No clearing of vegetation on lots or parcels will be allowed except that provided within approved rights-of-way identified above.
6. In order to minimize impacts to sensitive areas and the vegetation identified to be left remaining on-site, clearing which is authorized may be required to be conducted pursuant to an approved clearing and skidding plan designed to minimize impacts to soil and understory vegetation by providing for sequencing and staging where appropriate.

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APPENDIX E. REPORT WRITING GUIDELINES/CONTENTS

I. WETLAND REPORTS

A. Wetland Report Criteria

A wetland report shall be prepared by a qualified wetland biologist for each proposed project which may potentially affect a Navajo wetland. To facilitate project review in a timely manner, contents of the report must include the following:

1. A complete plant species list (including both common and scientific names) for all plants occurring on the site. Relative abundance of species and distribution of the major vegetative communities and significant trees shall also be included.
2. A written report shall be submitted to the Navajo Fish and Wildlife Department and shall include the following:
 - a. a characterization of the site including physical description, current land uses, general condition of the property and indications of historical alteration,
 - b. a general description of the surrounding property including land use and obvious alterations,
 - c. determine the potential impacts to the site and surrounding property such as loss of wildlife habitat, erosion potential, water quality degradation, reduction in plant species diversity, distribution or community composition,
 - d. methodology of the wetland study,
 - e. description of wildlife usage and indicate observed wildlife and the potential for wildlife occurrence,
 - f. list the soil types present (include SCS soil descriptions if available),
 - g. determine the potential impacts to wetland resources on the site as a result of the completion of the project.
3. A detailed map of the site shall be prepared and submitted with the written report. At a minimum the map shall contain the following applicable elements:
 - a. roads, easements, utility corridors, rights of ways, fence lines and other relevant site features,
 - b. the map shall be drawn at a scale convenient for interpretation and shall include contours at two foot intervals (at least in the area of the wetland features), for extremely large or complex projects the appropriate plan reviewer should be consulted to determine appropriate map scale and level of detail required,
 - c. hydrology of the site must be indicated detailing movement of water onto, through and out of the property,

- d. wetland boundaries including transition zones if possible,
- e. associated wetlands including those wetlands which may be beyond 100 feet of the site boundary if there is a surface water connection between the wetlands,
- f. vegetation on the site shall be mapped according to the classification system outlined in "Classification of Wetlands and Deepwater Habitats of the United States," Fish and Wildlife Service U.S. Department of the Interior, 1979 (FWS/OBS 79/31).

B. Wetland Report Technical Guidelines

Wetland delineations shall be accomplished using the guidelines set forth in the Corps of Engineers Wetlands Delineation Manual (Waterways Experiment Station January, 1987) as the technical basis for identifying and delineating wetlands.

A valid wetland delineation will include an evaluation of the entire project site and surrounding vicinity to determine whether wetlands are present on the site or are within 100 feet of the boundary of the project site. A sworn affidavit shall be signed by the wetland delineator affirming that the entire project site and surrounding vicinity within a minimum of 100 feet has been evaluated for the presence of wetlands.

II. Stream Reports

III. Wildlife Reports

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APPENDIX F. MITIGATION PLAN REQUIREMENTS.

Standards and Criteria. The applicant shall prepare either a general or detailed mitigation plan depending on the sensitivity of the feature for submission to the Department at the appropriate time. The mitigation plan shall include:

General Plan: The following components, as a minimum, are required for a general mitigation plan:

1. Goals of the mitigation plan;
2. A review of the alternative options that would avoid or lessen the impacts on the wetland;
3. Approximate site topography prior to and following construction;
4. Location of proposed wetland mitigation area;
5. Hydrologic patterns of the site following construction;
6. Nature of the mitigation including wetland types (in-kind, out-of-kind), general plant selection and justification, approximate project sequencing and schedule, and size of the new wetland buffer;
7. A mitigation maintenance plan;
8. A monitoring and contingency plan.

Detailed Plan: A detailed mitigation plan may be required when the proposed mitigation is in compensation for approved alterations to a Category I wetland or when more information is needed than can be supplied with the general plan. The detailed plan shall contain at a minimum:

1. A clear statement of the objectives of the mitigation. The goals of the mitigation plan should be stated in terms of the new wetland functions and values compared to the functions and values of the original wetland. Depending on the particular site and mitigation plan proposed, objectives may include some or all of the following:
 - a. qualitative and quantitative standards for success of the project, including hydrologic characteristics (water depths, water quality, hydroperiod/hydrocycle characteristics, flood storage capacity);
 - b. vegetative characteristics (community types, species composition, density, and spacing);
 - c. faunal characteristics, and final topographic elevations.

2. An ecological assessment of the wetlands values and wetland buffers that will be lost as a result of the activities, and of the replacement wetlands and buffers, including but not limited to the following:
 - a. Acreage of the project;
 - b. Existing functions and values;
 - c. Sizes of wetlands, wetland buffers, and areas to be altered;
 - d. Vegetative characteristics, including community type, areal coverage, species composition, and density;
 - e. Habitat type(s) to be enhanced, restored, or created; and
 - f. Dates for beginning and completion of mitigation project, and sequence of construction activities.
3. A statement of the location, elevation, and hydrology of the new site;
 - a. Relationship of the project to the watershed and existing water bodies;
 - b. Topography of site using two-foot contour intervals;
 - c. Water level data, including depth and duration of seasonally high water table;
 - d. Water flow patterns and drainage plan;
 - e. Grading, filling and excavation, including a description of imported soils;
 - f. Irrigation requirements, if any;
 - g. Water pollution mitigation measures during construction;
 - h. Areal coverage of planted areas to open water areas (if any open water is to be present), and;
 - i. Appropriate buffers.
4. A Planting Plan describing what will be planted, and where and when planting will occur:
 - a. Topsoil and substrate characteristics;
 - b. Specify substrate stockpiling techniques, and;
 - c. Plant sources. Plants to be used in restoration or creation efforts shall not be obtained from an existing wetland. Collection of seeds from wetland vegetation will be permitted provided disturbance to the collection site is minimal.
 - d. Planting instructions, including species, stock type and size, density or spacing of plants, and water and nutrient requirements.
5. A monitoring and maintenance plan, consistent with Appendix H.
 - a. Specify procedures for monitoring and site maintenance, and;
 - b. Submit monitoring reports to the Department.
6. A commitment from the applicant to submit a detailed contingency plan, consistent with these regulations, in the event that

monitoring of the project identifies failure to meet any of the performance standards identified in the mitigation plan.

7. A detailed budget for implementation of the mitigation plan, including monitoring, maintenance and contingency phases.

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APPENDIX G. MITIGATION PLANNING BEST MANAGEMENT PRACTICES

The following performance standards shall be incorporated into mitigation plans:

1. Use plants indigenous to the region (not introduced or foreign species);
2. Use plants adaptable to a wide range of water depths and that are appropriate for planting within identified elevation zones;
3. Plants should be commercially available from local sources (not from existing wetlands);
4. Emphasize plant species high in food cover value for fish and wildlife;
5. The grade or slope that water flows through the wetland is not to exceed 6 percent;
6. Plant mostly perennial species;
7. Avoid committing significant areas of the site to species that have questionable potential for successful establishment;
8. Plant selection must be approved by wetland biologist/plant ecologist;
9. Water depth is not to exceed 6.5 feet (2 meters);
10. Install an irrigation system, if necessary for initial establishment period; and
11. Construction specifications and methods must be approved by a qualified wetlands specialist and the Navajo Fish and Wildlife Department.

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APPENDIX H. WETLAND MITIGATION MONITORING AND PERFORMANCE STANDARDS

I. INTRODUCTION

This appendix summarizes performance standards to be met, monitoring methods, observation reports and recommendations for remediation. As compensation for unavoidable impacts to identified wetlands, creation for mitigation is generally encouraged to be located in areas of relatively low-value upland which will replicate, at the minimum, the complexity of existing wetland features. Monitoring of newly created wetlands and providing contingencies for shortfalls in mitigation goals is essential to assess and ensure project success. Typically, monitoring will extend for a period of three growing seasons, although an extension of the monitoring period may be required, and will encompass the following parameters:

1. survival rate of planted species,
2. measure of hydrologic support for created wetland areas,
3. evaluation of vigor, vitality and fecundity of installed vegetation,
4. correlation of plant community density, frequency and stability in created wetland with adjacent unperturbed wetland,
5. wildlife usage.

II. METHODOLOGY

Vegetation

Depending on the characteristics of the site and the stated objectives, terrestrial vegetation is typically measured in units of density, biomass and cover (Bonham 1989). To accomplish stated mitigation goals for a project, frequency, as a function of cover, will be used as an index for monitoring changes in vegetation over time and for comparing communities from undisturbed areas. Although density and plant cover may be estimated mathematically from frequency data, direct density measurements will be field recorded for valiative and comparative purposes. Biomass measurements are inappropriate in this situation, due to necessity of plant removal for collection of such data. One advantage that the sampling of a created community has over natural stands is that because the variety and density of plantings is known and, therefore, sampling method, sample size, and plot size can be readily determined before actual field sampling commences.

Frequency of herb and shrub layer plant appearance will be determined by using 1 square meter and 4 square meter quadrat

plots, based on the following suggested empirical plot sizes from Cain and Castro (1959):

Moss layer	0.01-0.12m ²
Herb layer	1-2m ²
Tall herbs and low shrubs	4m ²
Tall shrubs and low trees	10m ²
Trees	100m ²

Because plant densities and community composition are known from the planting schedule and the hydrologic regime is controlled by a flow control structure, a modification of the stratified random sampling method can typically be used.

The following is an example of sampling design. The sampling methodology described may be used without modification, modified to meet site specific conditions or a different sampling design may be substituted. All monitoring plans must be approved by a Navajo Fish and Wildlife Biologist prior to implementation.

A baseline will be established parallel to the long axis of the created wetland. Ideally the baseline will also parallel an existing associated wetland. Typically, randomly placed transects will be established normal (perpendicular) to the baseline. Transects must, however, intersect all of the created plant communities and different hydrologic regimes as well as similar areas in the undisturbed wetland. The baselines and transect endpoints will be permanently marked with steel rods driven into the ground. Randomly placed quadrat sample points will be established within each of the hydrologic regimes and plant communities within the created and existing wetland along each transect. Location of baseline, transects and sample points will be detailed on the wetland mitigation monitoring plan. Where shrub layers are present, a concentric placement of the 1 square meter quadrat will be used for sample counts.

Quadrat samplers should be constructed from 1/2 inch PVC pipe and fittings to form a square measuring 1 meter per side. Transects should be delineated with a cord extending from the baseline through the mitigation area. Quadrat samplers will be placed with the randomly chosen sample point in the center of the sampler, oriented with one side perpendicular to the cord. Within each sample area, all vegetation will be identified to species, counted, assigned a height and cover class and overall health described.

Plant cover will be indicated as the percentage of the total quadrat area (1 square meter for herb layer and 4 square

meters for shrub layer) underlying the aerial portions of a particular species.

Most created wetlands exhibit randomly distributed populations. In situations such as these, species which are rooted within the sample plot should be distinguished from those only represented by aerial offshoots in the plot. Studies have concluded that there is positive correlation between rooted frequency and species density and between shoot frequency and areal cover (Greig-Smith 1983). Plant cover is used as an indicator of plant growth and suitability for the hydrologic regime, and will be used for contingency planning.

Within the quadrat sample area, plants will be identified to species whenever possible, and assigned appropriate wetland status per Reed et. al. 1988. Differentiation will also be made between species included on the plant schedule and volunteer plants. General plant health will also be assessed at the same time, noting such signs of stress as premature flowering, unusual growth patterns or color, presence of dead wood, root suckering, or signs of disease. From the raw field data, estimates of density and cover will be made for each stratum and compared to the known density derived from the final mitigation plan. Replacement recommendations will be made as necessary to provide the eighty percent first year survival rate of wetland species. Subsequent years' density estimates will then be compared to the first year baseline estimates.

If required by the responsible Navajo field biologist, a photographic record will be maintained of each sample plot, with photographs having been taken at the time of the plant survey (and scheduled on a quarterly basis) to provide supplemental information of the general overall condition of the created wetland. Photographs will be taken from a sufficient height to record the entire quadrat area. Permanent photographic stations markers will be installed for locations other than at the quadrats.

III. STANDARDS OF SUCCESS

Vegetation

For any restoration, creation or enhancement project the following standards for evaluation of success must be used. Evaluation of the success of the mitigation plan will be based on these cover percentages and an 80% survival rate of the installed vegetation.

Cover of emergent species:

80% minimum cover after 3 years.

Canopy cover of shrub species:

20% minimum cover after 1 year;

- 30% minimum cover after 2 years;
- 45% minimum cover after 3 years;

Canopy cover of forested wetland:

- 10% minimum cover after 1 year;
- 20% minimum cover after 2 years;
- >45% minimum cover after 3 years;

Changes in created wetland plant community composition and density are expected as vegetation reacts to the specific hydraulic conditions present in individual microhabitats. Vegetation areal coverage is expected to increase over the span of the monitoring period while community diversity will probably decrease. Alteration in mitigation area plant community structure and standards of success may become necessary based on results of field observations. Functioning wetland plant communities other than those described in the mitigation plan may be acceptable. Plant substitutions may be recommended to better correspond to field conditions.

Hydrology

Water levels will be measured at permanent locations on the site including one in each of the created vegetational communities as well as in the existing wetland. Permanent shallow groundwater level monitoring wells will be installed at each station and properly camouflaged to discourage tampering. Groundwater and surface water levels will be measured seasonally for the remainder of the monitoring period and will be reported in the following year's report.

Degree of sedimentation will be measured relative to grade stakes placed at each monitoring well.

Wildlife

Visual and aural observations of wildlife will be made during two 15 minute observation periods from permanent observation points as indicated on the Wetland Monitoring Plan. Avian species diversity and abundance should be used as the primary indicator of wildlife usage. If nesting boxes and perches are installed they will be inspected for signs of bird usage. Incidental observation of other wildlife will also be recorded.

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APPENDIX I. WETLAND DETERMINATION FIELD DATA FORM

Field Investigator(s): _____
Project/Site: _____ Date: _____
Wetland Location/Name _____
Quadrangle: _____

Do normal environmental conditions exist at this site?

Yes___ No___ (If no, explain _____)

Has the vegetation, soils and/or hydrology been significantly disturbed?

Yes___ No___ (If yes, explain _____)

VEGETATION

	Dominant Plant Species	Indicator Status	Stratum	Specimen Collected
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____

SOILS

Series/Phase: _____
Subgroup: _____
Is the soil mottled? Yes ___ No ___ Gleyed? Yes ___ No ___
Matrix Color _____ Mottle Colors _____
Histic epipedon present? Yes ___ No ___
Soil type _____
Other hydric soil indicators: _____

HYDROLOGY

Is the ground surface inundated? Yes ___ No ___

Surface water depth _____

Is the soil saturated? Yes ___ No ___

Depth to free standing water in test pit/soil probe hole. _____

List other field evidence of surface water inundation or soil saturation. _____

DEFINITIONS AND INSTRUCTIONS

Normal environmental conditions or circumstances refers to the time of the year when the investigation is being performed. Are normal environmental processes necessary for proper wetland determination in evidence. Look to see if vegetation is lacking due to annual, seasonal or long term fluctuations in precipitation, surface water or ground-water levels. i.e. if you are in a suspected wetland area in the late summer when all annual wetland vegetation is gone and the soil is dry, you would answer the question no, indicating the probable need to revisit the site when annual vegetation is present. Even if the answer is no, continue with the rest of the form.

Hydrology refers to all surface waters and groundwater within 18" of the surface. Vegetation. List all plants with at least 20% areal coverage and give percent cover. You may have as many as 20 dominant plants.

Determine wetland vegetation in each of four strata:

1. tree - 5" or greater dbh and twenty feet tall or taller;
2. saplings - under 5" dbh and > 20' tall);
3. shrub - 3' to 20' tall including multi-stemmed, bushy shrubs, woody vine and small trees and saplings;
4. herbaceous plants including grasses, ferns, forbs, non-persistent vines and tree seedlings.

Indicator status refers to the frequency that a plant is found in a wetland. This information is found in the "National List of Plant Species that Occur in Wetlands". You do not need to fill in this column in the field.

Do not fill in soil series phase or subgroup designation.

A histic epipedon is an 8 to 16 inch thick organic layer at or near the surface of a hydric mineral soil that is saturated with water for 30 consecutive days or more in most years.

The matrix color is the dominant soil color as determined by comparison with the Munsell soil color chart. (Wetland soils are usually black or very dark brown with mottles.)

Mottles are spots or blotches of different colors or shades of colors interspersed within the matrix color.

Gleyed soils are predominantly neutral in color and occasionally greenish or bluish gray.

Other hydric soil indicators may be: 30% or greater organic matter content, presence of hydrogen sulfide gas (rotten egg smell) and/or iron or manganese concretions (soft, red or brown nodules).

Field evidence of soil saturation may be established by physically squeezing water from the soil, or by observing any of the following: oxidized rhizospheres, water marks on trees and rocks, drift lines, water-borne sediment deposits, water stained leaves or tree trunks, and surface scoured areas (water cut channels).

Oxidized rhizospheres. Iron oxide concretions (orangish and reddish brown in color) forming along the channels of living roots and rhizomes as evidence of soil saturation for a significant period during the growing season. Some plants have the ability to transport atmospheric oxygen to their roots.

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APPENDIX J. WETLANDS RATING OFFICE FORM

Name of Rater: _____ Date: _____		
Name of wetland (if known) _____		
Is this a jurisdictional wetland? YES ____ NO ____		
Directions: _____		

Quad. Name _____		
Sources of information: (Check all that apply)		
Site visit: ____ USGS Topo Map: ____ NWI Map: ____ Aerial Photo: ____		
Soils Survey: ____ NNHP Database: ____		
Other: _____		
When both the field and office rating forms are completed enter the Wetland Category here: _____.		
ANSWER ALL QUESTIONS BELOW. If the data source identifies the wetland as satisfying any of the questions below, circle the category in the "Category" column.	DATA SOURCE	Circle Correct Response
Does the wetland contain individuals of Federally-listed Threatened or Endangered or Candidate plant or animal species? Is the wetland an historic location of a plant species thought to be possibly extinct or extirpated from the Navajo Nation?	NNHP database	Yes: then Category I No
Does the wetland contain individuals of Navajo-listed (Group 2 or 3) Endangered or (Group 4) Candidate animal species?	NNHP database	YES NO
Does the wetland contain documented habitats for Navajo listed (Group 2 or 3) or candidate Threatened or Endangered plant species?	Navajo Fish and Wildlife NNHP	Yes: then Category I No
Does the wetland contain documented habitats of Navajo (Group 2 or 3) listed or candidate Threatened or Endangered fish species, or races of fish?	Navajo Fish and Wildlife NNHP	Yes: then Category I No
Is the wetland already on record with the Navaho Natural Heritage Program as a high quality native wetland?	NNHP	Yes: then Category I No

Is the wetland documented habitat of regional (intermountain) or national significance for migratory birds?	Navajo Fish and Wildlife NNHP	Yes: then Category I No
Is the wetland documented as an area of Local Cultural Significance?	NHPD	Yes: then Category C No
Does the wetland contain individuals of Navajo-listed Candidate (Group 4) or watch list plant species?	NNHP	Yes: then Category II No
Does the wetland contain documented habitat for Navajo-listed (or Candidate) Group 4 or watch list wildlife species?	Navajo Fish and Wildlife NNHP	Yes: then Category II No
Does the wetland contain documented habitats of Navajo-listed Group 4 or watch list fish species or races of fish?	Navajo Fish and Wildlife NNHP	Yes: then Category II No
Does the wetland contain priority species or habitats documented by the Navajo Natural Heritage Program as a Priority Habitat or Species?	NNHP	Yes: then Category II No

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WETLANDS FIELD RATING FORM

Field Investigator(s): _____
Date: _____ Watershed: _____
Quad Name: _____
Directions: _____

WHEN THE FIELD RATING FORM IS COMPLETED ENTER TOTAL NUMBER AND/OR CATEGORY
HERE AND INDICATE REASON FOR CLASSIFICATION. _____

A. High Quality Natural Heritage Wetland

A1. Is there significant evidence of human-caused changes to topography or hydrology of the wetland? Significant changes could include clearing, grading, filling, logging of the wetland or its immediate buffer, or culverts, ditches, dredging, diking or drainage of the wetland. Briefly describe the changes. _____

A2. Are there populations of non-native plants which are currently present and appear to be invading natural populations? Briefly describe any non-native plant populations. _____

A3. Is there significant evidence of human-caused disturbance of the water quality of the system? Degradation of the water quality could be evidenced by culverts entering the system, direct road/parking lot runoff, evidence of historic dumping of wastes, sewage effluent, oily sheens, extreme eutrophic conditions (algal growth), livestock use or dead fish etc. Briefly describe: _____

CIRCLE THE CORRECT RESPONSE FOR THE QUESTIONS IN PARTS B AND C

B. Irreplaceable Ecological Functions:

B1. Does the wetland have at least 1/2 acre of contiguous area underlain by a soil of largely organic origin?

YES IF YES THEN GO TO B1.1.1
NO IF NO THEN GO TO B2

B1.1.1 Does this area have less than 25 percent areal cover of any combination of species from the list of invasive or exotic species?

YES IF YES THEN IT IS A CATEGORY ONE WETLAND
NO IF NO THEN GO TO B2

B2. Does the wetland have a forested class (an area dominated by trees >20 feet tall and >4 inches dbh), regardless of amount of exotic/invasive species?

YES IF YES THEN IT IS A CATEGORY ONE WETLAND
NO IF NO THEN GO TO B4

B3. If the wetland does not have a forested class - does it have significant structural diversity as characterized by a multi-layer community of trees:

greater than 50 feet tall and,
trees 20-49 feet tall and,
shrubs and,
herbaceous groundcover?

YES IF YES THEN GO TO B3.3.1
NO IF NO THEN GO TO B4

B3.3.1. Does at least one layer (canopy, young trees, shrubs, herbs) have more than 50 percent (areal coverage) of plants from the invasive/exotic plant species list?

YES IF YES THEN GO TO B4
NO IF NO THEN IT IS A CATEGORY ONE WETLAND

B4. Is the wetland directly associated with any of the following rivers: San Juan, Colorado or the Little Colorado River.

YES IF YES THEN IT IS A CATEGORY ONE WETLAND
NO IF NO THEN GO TO C

C. Category IV Wetlands:

C1. Is the wetland entirely artificial? Artificial wetlands include but are not limited to drainage ditches, reservoirs, treated effluent, irrigated fields and stock watering ponds constructed in historical uplands.

YES

IF YES THEN IT IS A CATEGORY FOUR WETLAND

NO

IF NO THEN GO TO D

C2. Is the wetland smaller than 1/2 acre and hydrologically isolated and entirely lacking native natural vegetation?

YES

IF YES THEN IT IS A CATEGORY FOUR WETLAND

NO

IF NO THEN GO TO D.

ANSWER ALL OF THE QUESTIONS IN SECTION D AND SCORE IN COLUMN TO THE RIGHT

D. Significant Habitat Value:

D1. Total wetland area.

Enter the acreage of the wetland here _____ (acres).

How did you determine area of wetland? (visual estimation, pacing, measurement, survey, map other?) _____

From the wetland acreage determination above, calculate the number of appropriate number of points that will be assigned to the wetland from the list below.

If the wetland contains:

more than 20 acres then score 10 points,
between 10 and 20 acres then score 8 points,
between 5 and 10 acres then score 5 points,
between 1 and 5 acres then score 4 points,
between .1 and 1 acres then score 3 points,
less than 1 acre then score 2 points.

D2. Wetland classes.

For each wetland evaluated, circle all classes from the list below that you found in the wetland and indicate how you determined size of wetland features. (More than one class may be found in a wetland).

1. Open water: if the wetland contains an open water area of any size then **score 2 points. OR**

If the open water area is greater than 1/2 acre or is greater than 10 percent of the total wetland area then **score 3 points.**

2. Aquatic beds: if the wetland contains a aquatic bed class the **score 1 point. OR**

If the aquatic bed is greater than 10 percent of the open water or is greater than 1/2 acre, then **score 3 points.**

3. Emergent: if the wetland contains an emergent class then score 1 point.

4. Scrub-shrub: if the wetland contains a scrub-shrub class then **score 1 point. OR**

If the scrub-shrub area is greater than 1/2 acre or is greater than 10 percent of the total wetland area then **score 2 points.** If the vegetation in this scrub-shrub area is composed of <50% exotic/invasive species then **score 3 points.**

5. Forested: if the wetland contains a forested class then **score 2 points. OR**

If the area of forested class is greater than 1/2 acre or is greater than 10 percent of the total wetland area, then **score 3 points.**

D3. Plant species diversity.

After you have determined the vegetative classes for each wetland (D2 above) count the number of different species in each class and assign the correct score from the table below. You do not have to name the plant species.

For example: If a wetland has an emergent class with 4 species and a scrub-shrub class with 2 and a forested class with 2 species you would circle 3, 1 and 3 in the right column.

<u>WETLAND CLASS</u>	<u>NUMBER OF PLANT SPECIES</u>	<u>SCORE</u>
aquatic bed	1 to 2	1
aquatic bed	more than 2	2
emergent	1 to 2	1
emergent	3	2
emergent	more than 3	3
scrub-shrub	1 to 2	1
scrub-shrub	3	2
scrub-shrub	more than 3	3
forested	1	2
forested	2	3

D4. Structural diversity.

If the wetland has:

- trees greater than 50 feet tall then add 1 point.
- trees between 20 and 49 feet tall then add 1 point.
- a mixture of evergreen and deciduous trees then add 1 point.
- shrubs then add 1 point.
- herbaceous ground cover then add 1 point.

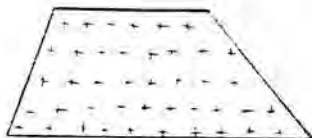
D5. Habitat features.

Answer the questions below and assign appropriate score if there is any evidence of the following:

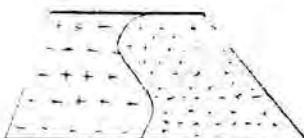
1. current use by beavers -- score 3 points.
2. a heron rookery located within 300 feet -- score 2 points.
3. raptor nest/s located within 300 feet -- score 1 point.
4. at least 3 standing dead trees (snags) per acre -- score 1 point.
5. any of these standing snags are greater than 10" in diameter -- score 1 point.
6. any other perches (wires, poles or posts) -- score 1 point.
7. at least three downed logs per acre -- score 1 point.

D6. Decide from the diagrams below whether interspersions between wetland classes is high, moderate, low or none?

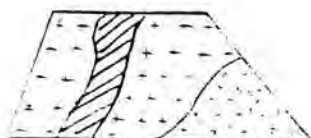
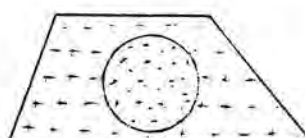
none=0 point



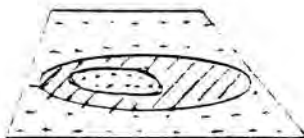
low=1 point



low=1 point



moderate=2 points



moderate=2 points



high=3 points

D7. Springs.

At any time of the year, is the primary hydrologic support for the wetland derived from a spring, seep or other groundwater discharge, or is there any evidence that the wetland was at one time connected to a spring?

YES IF YES GO TO D7.1.1
NO IF NO THEN GO TO D8

1.1. Does the spring appear to flow year round and also appears to have not been significantly altered?

YES IF YES THEN IT IS A CATEGORY ONE WETLAND
NO IF NO THEN GO TO D7.2.2

2.2. Has the spring been significantly altered to provide water for human or animal use but still provides hydrologic support for the wetland?

YES IF YES THEN SCORE 3 POINTS.

NO IF NO THEN GO TO D7.3.3

3.3. Has the spring been altered sufficiently to eliminate the surface water connection with the wetland (i.e. spring box, well nearby or pump present?)

YES IF YES THEN GO TO D8

D8. Connection to streams. (Score one answer only.)

If the wetland is connected at any time of the year via surface water:

to a perennial stream or to a seasonal stream with fish then score 5 points;

or, if connected to a seasonal stream without fish then score 3 points;

or, if it is not connected to any stream score 0 points.

D9. Buffers

Examine all property within 200 feet of all sides of the wetland and then estimate (to the nearest 5 percent) the percentage of each land-use type that adjoins the wetland boundary and enter number into appropriate space.

Buffer land-use type

% of buffer

- a. _____ roads, buildings or impervious surface
- b. _____ grazed land or cropland
- c. _____ ungrazed land or native grasslands
- d. _____ forest or shrub land

Score 0 points for a.

If % in b is between 0 and 49 then score 2 points
50 and 100 then score 1 point

If % in c is between 0 and 49 then score 3 points
50 and 100 then score 4 points

If % in d is between 0 and 49 then score 4 points
50 and 100 then score 5 points

D10. Connection to other habitat areas:

- a. If there is a connection to other wetlands within 0.25 mile, or a corridor greater than 100 feet wide with good forest or shrub cover to any other habitat area, then score 5 points.
- b. If there is a narrow corridor less than 100 feet wide with good cover, or a wide corridor greater than 100 feet wide with low cover to any other habitat area then score 3 points.
- c. If there is a narrow corridor less than 100 feet wide with low cover or a significant habitat area within 0.25 mile but no corridor present then score 1 point.
- d. If the wetland buffer is completely isolated by development and/or cultivated agricultural land then score 0 points.

TOTAL _____

If the total score is greater than or equal to 20 points then the wetland is classified as CATEGORY II.

If the total score is less than 20 points then the wetland is classified as CATEGORY III.

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APPENDIX L. HYDRAULIC ALTERATION NOTIFICATION

General Information

Contact Person: _____

Organization: _____

Address: _____

Phone: _____ Date: _____

Project Information

Name of the resource where work will occur (if it is unnamed, give name of nearest identified water body): _____

Tributary to: _____

Watershed: _____

Location (lat and long): _____

Type of Project: _____

Starting Date: _____

Anticipated Completion Date: _____

Please provide a brief summary of the action to be taken. Include a short description of the resource to be impacted, the purpose of the action, type of equipment to be used, resource protection measures and required restoration or mitigation methods.

DRAFT

APPENDIX M. NAVAJO NATION WETLAND PLANT STATUS LIST

SCIENTIFIC NAME	COMMON NAME	WETLAND STATUS
<i>Abies concolor</i>	grand fir	
<i>Acer negundo</i>	box elder	FACW-
<i>Acer glabrum</i>		FAC
<i>Acer grandidentatum</i>		
<i>Acer macrophyllum</i>	big-leaf maple	
<i>Ailanthus altissima</i>		FACU
<i>Alnus tenuifolia</i>		
<i>Alnus oblongifolia</i>		FACW+
<i>Alnus rhombifolia</i>		
<i>Betula occidentalis</i>		FACW
<i>Blepharoneuron tricholepsis</i>		
<i>Carex</i> spp.		
<i>Catalpa bignonioides</i>		
<i>Celtis reticulata</i>		FACU
<i>Chara</i> spp.		
<i>Clyceria borealis</i>		
<i>Cornus stolonifera</i>		
<i>Crataegus</i> spp.		
<i>Cupressus arizonica</i>		
<i>Cyperus</i> spp.		
<i>Distichilis spicata</i>		
<i>Eleocharis parvula</i>		
<i>Elodea</i> spp.		
<i>Fraxinus pennsylvanica</i>		
<i>Fraxinus velutina</i>		
<i>Glyceria</i> spp.		
<i>Juglans major</i>		
<i>Juncus</i> spp.		

<i>Juniperus deppeana</i>		
<i>Luzula</i> spp.		
<i>Maclura pomifera</i>		
<i>Morus microphylla</i>		
<i>Myriophyllum spicatum</i>		
<i>Nitella</i> spp.		
<i>Parthenocissus vitacea</i>		
<i>Picea pungens</i>		
<i>Pinus ponderosa</i>		
<i>Platanus virens</i>		
<i>Platanus wrightii</i>		
<i>Platanus racemosa</i>		
<i>Platanus</i> spp.		
<i>Populus fremontii</i>		
<i>Populus angustifolia</i>		
<i>Populus tremuloides</i>		
<i>Populus fremontii</i> var. <i>mesotae</i>		
<i>Populus trichocarpa</i>		
<i>Potamogeton</i> spp.		
<i>Potentilla fruticosa</i>		
<i>Prosopis juliflora</i>		
<i>Prunus virens</i>		
<i>Prunus americana</i>		
<i>Prunus emarginata</i>		
<i>Pteridium aquilinum</i>		
<i>Quercus emoryi</i>		
<i>Quercus chrysolepis</i>		
<i>Quercus agrifolia</i>		
<i>Quercus gambelii</i>		
<i>Quercus arizonica</i>		
<i>Rhus toxicodendron</i>		

<i>Rhus glabra</i>		
<i>Ribes</i> spp.		
<i>Robinia neomexicana</i>		
<i>Rubus</i> spp.		
<i>Sagittaria</i> spp.		
<i>Salix</i> spp.		
<i>Salix bonplandiana</i>		
<i>Salix scouleriana</i>		
<i>Salix lasiolepus</i>		
<i>Salix monticola</i>		
<i>Salix exigua</i>		
<i>Salix irrorata</i>		
<i>Salix bebbiana</i>		
<i>Salix irrorata</i>		
<i>Salix lasiandra</i>		
<i>Salix laevigata</i>		
<i>Salix goodingi</i>		
<i>Salix nigra</i>		
<i>Sambucus racemosa</i>		
<i>Sambucus glauca</i>		
<i>Sambucus mexicana</i>		
<i>Sapindus saponaria</i>		
<i>Sapindus drummondi</i>		
<i>Scirpus acutus</i>		
<i>Scirpus americanus</i>		
<i>Scirpus pallidus</i>		
<i>Scirpus</i> spp.		
<i>Tamarix chinensis</i>		
<i>Typha latifolia</i>		
<i>Vitis arizonica</i>		