

RESOLUTION OF THE
RESOURCES AND DEVELOPMENT COMMITTEE
23rd Navajo Nation Council --- Fourth Year, 2018

AN ACTION

RELATING TO RESOURCES AND DEVELOPMENT COMMITTEE; APPROVING A
SAND AND GRAVEL LEASE TO SAN JUAN SAND AND GRAVEL, LLC, TO
EXTRACT SAND AND GRAVEL FROM 40 ACRES, MORE OR LESS, OF NAVAJO
NATION TRUST LANDS, AND AN ACCESS ROAD OF 4.3 ACRES, MORE OR
LESS, OF NAVAJO NATION TRUST LANDS LOCATED WITHIN THE SAN JUAN
CHAPTER VICINITY, NAVAJO NATION (SAN JUAN COUNTY, NEW MEXICO)

BE IT ENACTED:

Section One. Authority

- A. The Resources and Development Committee is a standing committee of the Navajo Nation Council. 2 N.N.C. § 500(A).
- B. The Resources and Development Committee of the Navajo Nation Council has authority to give final approval of all land withdrawals, non-mineral leases, permits, licenses, rights-of-way, surface easements and bonding requirements on Navajo Nation lands and unrestricted (fee) land. This authority shall include subleases, modifications, assignments, leasehold encumbrances, transfers, renewals, and terminations. 2 N.N.C. § 501 (B) (2).

Section Two. Findings

- A. San Juan Sand and Gravel, LLC, 6991 E. Camelback Road, Suite B-308, Scottsdale, Arizona 85215, has submitted a request for a sand and gravel lease to occupy 40 acres and an access road right-of-way of 4.3 acres, more or less, of Navajo Nation Trust Lands. The proposed Sand and Gravel Lease is attached hereto as **Exhibit 1**. San Juan Sand and Gravel, LLC, was formerly known as Dibe Niitsa Sand & Gravel.
- B. The San Juan Sand and Gravel, LLC, has submitted its San Juan Sand & Gravel Project Proposal, dated February 7, 2017 to the General Land Development Department. The San Juan Sand & Gravel Project Proposal is made a part hereof and is attached as **Exhibit 2, with Appendices A through Q**.
- C. The proposed Sand and Gravel Lease consists of 40 acres, more or less, of Navajo Nation Trust Lands located from E/2 Section

12, Township 29 North, Range 17 West and the West/2 of Section 07, Township 29 North, Range 16 West, NMPM, San Juan County, State of New Mexico. See **Exhibit 2, Appendix C.**

- D. The Division of Natural Resources, Navajo Land Department, Department Manager III has approved a Land Withdrawal Designation for the San Juan Sand and Gravel, LLC. The Land Withdrawal Designation is attached as attached hereto as **Exhibit 2, Appendix B.**
- E. Environmental and archaeological studies and clearances have been completed and are attached hereto and incorporated herein by this reference. The Environmental Assessment is attached hereto as **Exhibit 2, Appendix F.** The Biological Resources Survey is attached hereto as **Exhibit 2, Appendix G.** The Cultural Resources Survey is attached hereto as **Exhibit 2, Appendix H.** The Navajo Nation Environmental Protection Agency memorandum is attached hereto as **Exhibit 2, Appendix K.**
- F. The Mining Drawings and Reclamation Plan Drawings are attached hereto as **Exhibit 2, Appendix D and Appendix E.** The Evacuation Plan is attached as **Exhibit 2, Appendix L.**
- G. The San Juan Chapter supports the proposed sand and gravel pit and access road for the benefit of the community. See Resolution SANJ-2016-16 attached hereto as **Exhibit 2, Appendix A.**
- H. The San Juan Sand and Gravel, LLC, Lease for sand and gravel operations in the vicinity of San Juan Chapter has completed an Executive Official Review with various Departments and Programs providing approval and supplemental comments. Executive Official Review Document No. 007629 is attached hereto as **Exhibit 3.**
- I. The Navajo Nation Sand and Gravel Lease, **Exhibit 1**, page 3 paragraph number 11 states: "Sand and gravel material shall not be used for projects outside the Nation unless it is expressly authorized by the Resources and Development Committee of the Navajo Nation Council".
- J. The San Juan Sand and Gravel, LLC, requests express authorization by the Resources and Development Committee to authorize use of the sand and gravel material for projects inside and outside the Nation.

Section Three. Approval

- A. The Resources and Development Committee of the Navajo Nation Council hereby approves a Sand and Gravel Lease for the San Juan Sand and Gravel, LLC, for 40 acres, more or less, and an access road right-of-way of 4.3 acres, more or less, of Navajo Nation Trust Lands in the San Juan Chapter vicinity, Navajo Nation (San Juan County, New Mexico) to operate and maintain a sand and gravel pit and access road. The location is more particularly described on the survey maps attached as **Exhibit 2, Appendix C.**
- B. The Resources and Development Committee expressly authorizes the use of the sand and gravel material for projects inside and outside the Nation.
- C. The Navajo Nation hereby approves the Sand and Gravel Lease subject to, but not limited to the Terms and Conditions in the Lease attached hereto as **Exhibit 1** with the express authorization for the use of the sand and gravel material for projects inside and outside the Nation.
- D. The Navajo Nation hereby approves the Sand and Gravel Lease subject to, but not limited to the Terms and Conditions in the Lease attached hereto as **Exhibit 1.**
- E. The Navajo Nation hereby authorizes the President of the Navajo Nation to execute any and all documents necessary to implement the intent and purpose of this resolution.

CERTIFICATION

I, hereby, certify that the following resolution was duly considered by the Resources and Development Committee of the 23rd Navajo Nation Council at a duly called meeting at the Indian Wells Chapter, Indian Wells, Navajo Nation (Arizona), at which a quorum was present and that same was passed by a vote of 4 in favor, 0 opposed, 1 abstained on this 11th day of April 2018.



Alton Joe Shepherd, Chairperson
Resources and Development Committee
of the 23rd Navajo Nation Council

Motion: Honorable Benjamin Bennett
Second: Honorable Leonard Pete



NAVAJO NATION SAND AND GRAVEL LEASE

THIS AGREEMENT for a Sand and Gravel Lease (Lease) is made and entered into this _____ day of _____, _____, by and between the Navajo Nation, whose address is Post Office Box 1910, Window Rock, Arizona 86515, and San Juan Sand and Gravel LLC herein called the Lessee and whose address is at 6991 E. Camelback Road, Suite B-308 Scottsdale, AZ 85251.

Definitions:

Sand & Gravel means: Borrow (Earth,) Sand and Natural or Processed Gravel.

Department means the Navajo Nation Minerals Department.

Navajo Nation (Nation) means the Navajo Tribe of Indians.

Secretary means the Secretary of the U.S. Department of Interior or his/her designated representative.

Performance bond means a surety bond, collateral bond or self-bond or a combination thereof, by which a lessee assures faithful performance of all the requirements this lease and mining and reclamation plan.

Reclamation means those actions taken to restore mined land as required to a post mining land use approved by the Department.

Resources Committee means the Resources Committee of the Navajo Nation Council.

Slope means average inclination of a surface, measured from the horizontal. Normally expressed as a unit of horizontal distance to vertical distance.

Stabilize means to control movement of soil, or areas of disturbed earth by modifying the geometry of the mass, or by otherwise modifying physical or chemical properties, such as by providing a protective surface coating.

Ton means 2000 pounds.

Water table means the upper surface of a zone of saturation.

The Navajo Nation hereby grants Lessee a Lease right to extract sand and gravel from E/2 of Section 12, Township 29 North, Range 17 West and the West/2 of Section 07, Township 29 North, Range 16 West, NMPM, San Juan County, State of New Mexico. The Lease occupies an area of 40 acres, more or less, and the access road right-of-way consists of 4.3 acres, more or

less. The location maps and legal descriptions of the Lease and the access road are shown in attached Exhibits A and B, respectively. The Lease shall be subject to the following terms and conditions.

1. The Lease shall be valid for a period of Five (5) years effective the date it is approved by the Secretary. This date shall be known as the Effective Date of the Lease.

2. Payments to the Nation by the Lessee:

(i) An annual advance royalty for each lease year. The first payment in the amount of Fifteen Thousand dollars (\$15,000.00) is due within ten (10) days of the Effective Date. Subsequent annual advance royalty payments are due on or before each anniversary of the Effective Date. The annual advance royalty payment shall be credited against production royalties only during the year for which the advance royalty has been paid.

(ii) A royalty at the rate of \$2.00 per ton for each ton of material removed and sold from the Lease premises. The royalty payment shall be made on a monthly basis within fifteen (15) days following the month for which the royalty is due.

(iii) Annual consideration of \$3,922.74 for the access road right-of-way. The first payment is due (unless it is paid in lump sum for the entire term of the lease) within ten (10) days of the Effective Date and all subsequent payments shall be made on or before each anniversary of the Effective Date.

(iv) The subsequent annual advance payments, the royalty rate and the right-of-way consideration (if not paid in lump sum) shall be subject to annual adjustments on each anniversary of the Effective Date. The adjustments shall be based upon the increase in the Consumer Price Index (CPI), U.S. City Average for All Urban Consumers. The CPI for February 2017 shall be used as the base for all adjustments.

3. Mining and Reclamation Plan: The Lessee shall provide a mining and reclamation plan (Plan) to the Nation and to the U.S. Department of Interior (DOI). The Lessee shall comply with all the requirements of the approved Plan). Lessee shall obtain the approval of the Nation and the DOI prior to making any changes in the approved Plan. The plan will include the area to be mined with drainage control; annual tonnage estimates for the mining area; and the planned reclamation timing to coincide with the mining. As a general rule, slopes will not exceed 5:1 and majority of the revegetation species will be native to the area.

4. Bond: The Lessee shall furnish a performance and reclamation bond for One Hundred and Sixty Thousand dollars (\$160,000.00). The Lessee shall maintain this bond at all times even if the Lease has expired or is terminated. The bond shall only be released with the written consent of the Navajo Nation. The bond may also be increased by the Navajo Nation and/or the DOI. The Lessee shall request a bond release to DOI only after the Lease has been expired or terminated and Lessee has fulfilled all its obligations, including payments to the Nation and reclamation, under the terms and conditions of this Lease.

5. **Records and Reports:** The Lessee shall maintain accurate records of all sand and gravel material extracted, stockpiled, sold and removed from the Lease and the royalty due and paid to the Navajo Nation. A copy of the records shall be provided to the DOI and the Navajo Nation Minerals Department (P.O. Box 1910, Window Rock, AZ: 86515) on a monthly basis within fifteen (15) days following the sale month. Monthly production reports must be filed even if there was no sale of material.

6. **Method of Payments:** All required payments under Section 2 of this Lease shall be made to the department, in lawful money of the United States. A copy of the payments shall be provided to the DOI.

7. **Disposition of Minerals and Surface:** The Navajo Nation expressly reserves the right to use, lease or otherwise dispose of the minerals not covered by this Lease and the surface of the lands embraced within this Lease under existing laws and laws hereinafter enacted. Lessor further reserves the right to grant additional leases for the extraction and removal of sand and gravel or for any other purposes from the lands described herein. Such disposition and use shall be subject to the prior rights of the Lessee herein to use of so much of the said surface as is necessary in the extraction and removal of sand and gravel described in accordance with this Lease.

8. **Diligence:** The Lessee shall exercise diligence in the conduct of its mining operation and the land described herein shall not be held for speculative purposes, but in good faith for the extraction of sand and gravel and shall begin operation within one (1) month of the Effective Date and shall continue production thereafter at the rate specified in the plan.

9. **No work shall commence until the mandatory mine health and safety training has been provided to the workers pursuant to 30 CFR, Part 46.** The Lessee shall maintain the required training plan pursuant to the provisions of 30 CFR, Part 46. The Department shall be listed in the training plan if the Lessee wants the Department to conduct the training. The Lessee may contact the Department to arrange for the training.

10. The Lessee may develop, use and occupy the area under the Lease for the purpose of removing sand and gravel material. The Lessee may not develop, use or occupy the area under the Lease for any other purpose without the prior written approval of the Nation and the Secretary. Such approval of the Nation may be granted upon conditions or withheld at the sole discretion of the Nation. The Lessee may not develop, use or occupy the area under the permit for any unlawful purpose. Any unlawful use of the land within the Lease shall render the Lease void at the option of the Nation and/or the Secretary.

11. Sand and gravel material shall not be used for projects outside the Nation unless it is expressly authorized by the Resources Committee of the Navajo Nation Council.

12. In all activities conducted by the Lessee within the Navajo Nation, the Lessee shall abide by all laws and regulations of the Nation and of the United States, now in force and effect or as hereafter may come into force and effect, including but not limited to the following:

- a. Title 25, Code of Federal Regulations, Parts 162 and 169;
- b. Title 30, Code of Federal Regulations, Parts 46 and 56;
- c. The Navajo Nation Mine Safety Code 18 N.N.C. § 401;
- d. All applicable federal and Nation antiquities laws and regulations, with the following additional condition: In the event of a discovery, all operations in the immediate vicinity of the discovery must cease and the Navajo Nation Historic Preservation Department must be notified immediately. As used herein, "discovery" means any previously unidentified or incorrectly identified cultural resources, including but not limited to archaeological deposits, human remains, or location reportedly associated with Native American religious/ traditional beliefs or practice.
- e. The Navajo Preference in Employment Act, 15 N.N.C. §§ 601 et seq., the Navajo Nation Business Opportunity Act, 5 N.N.C. §§ 201 et seq., and
- f. The Navajo Nation Water Code, 22 N.N.C. § et seq., Lessee shall apply for and submit all applicable permits and information to the Navajo Nation Water Resources Department, or its successor.

13. The Lessee shall ensure that the air quality of the Nation is not unduly degraded during operations by violating federal and Nation's applicable laws and regulations.

14. The Lessee shall clear and keep clear the lands within the Lease area to the extent compatible with the purpose of the Lease, and shall dispose of all vegetation and other materials cut, uprooted, or otherwise accumulated during any surface disturbance activities.

15. The Lessee shall at all times during the term of the Lease and at the Lessee's sole cost and expense, maintain the land subject to the Lease and all improvements located thereon and make all necessary reasonable repairs.

16. The Lessee shall obtain prior written permission to cross an existing permit or lease areas, if any, from the appropriate parties.

17. The Lessee shall be responsible for and promptly pay all damages when they are sustained, from actions the Lessee causes.

18. The Lessee shall indemnify and hold harmless the Nation and the Secretary and their respective authorized agents, employees, land users and occupants against any liability for loss

of life, personal injury and property damages arising from the development, use or occupancy or use of area under the Lease by the Lessee.

19. The Lessee shall not assign, convey, transfer or sublet in any manner whatsoever, the lease or any interest therein, or in or to any of the improvements on the land subject to the lease, without the prior written consent of the Nation and the Secretary. Any such attempted assignment, conveyance or transfer without such prior written consent shall be void and of no effect. The consent of the Nation may be granted, granted upon conditions or withheld at the sole discretion of the Nation.

20. The Nation may recommend termination of the Lease by DOI for violation of any of the terms and conditions stated herein.

21. At the termination of the Lease, the Lessee shall peaceably and without legal process deliver up the possession of the premises, in good condition, usual wear and tear accepted. Upon the written request from the Nation, the Lessee shall provide the Navajo, at the Lessee's sole cost and expense, with an environmental audit assessment of the premises at least thirty (30) days after completion and notification to the Nation that all required reclamation has been performed.

22. Holding over by the Lessee after the termination of the Lease shall not constitute a renewal or extension thereof or give the Lessee any rights hereunder or in to the land subject to the Lease or to any improvements located thereon.

23. The Nation and the Secretary shall have the right, at any reasonable time during the term of the permit, to enter upon the premises, or any part thereof, to inspect the same and any improvements located therein. The Nation and Secretary have further right to audit all payments due to the Nation.

24. By acceptance of the grant of Lease, the Lessee consents to the full territorial legislative, executive and judicial jurisdiction of the Nation, including but not limited to the jurisdiction to levy fines and to enter judgments for compensatory and punitive damages and injunctive relief, in connection with all activities conducted by the Lessee within the Navajo Nation or which have a proximate (legal) effect on persons or property within the Nation.

25. By acceptance of the grant of the Lease, the Lessee covenants and agrees never to contest or challenge the legislative, executive or judicial jurisdiction of the Nation on the basis that such jurisdiction is inconsistent with the status of the Nation as an Indian nation, or that the Navajo Nation government is not a government of general jurisdiction, or that the Navajo Nation government does not possess full police power (i.e., the power to legislate and regulate for the general health and welfare) over all lands, persons and activities within its territorial boundaries, or on any other basis not generally applicable to a similar challenge to the jurisdiction of a state government. Nothing contained in this provision shall be construed to negate or impair federal responsibilities with respect to the land subject to the Lease or to the Nation.

26. Any action or proceeding brought by the Lessee against the Nation in connection with or arising out of the terms and conditions of the Lease shall be brought only in the Courts of the

Nation, and no such action or proceeding shall be brought by the Lessee against the Nation in any court of any state.

27. Nothing contained herein shall be interpreted as constituting a waiver, express or implied, of the sovereign immunity of the Nation.

28. Except as prohibited by applicable federal law, the law of the Nation shall govern the performance and enforcement of the terms and conditions contained herein.

29. The terms and conditions contained herein shall extend to and be binding upon the successors, heirs, assigns, executors, administrators, employees and agents, including all contractors and subcontractors, of the Lessee, and the term "Lessee" whenever used herein, shall be deemed to include all such successors, heirs, assigns, executors, administrators, employees and agents.

30. There is expressly reserved to the Nation full territorial legislative, executive and judicial jurisdiction over the area under the Lease and all lands burdened by the Lease, including without limitation over all persons, including the public, and all activities conducted or otherwise occurring within the area under the Lease and all lands burdened by the Lease shall be and forever remain Navajo Indian Country for purposes of Navajo Nation jurisdiction.

31. The Lessee is required to maintain and submit a certificate issued by an insurance company authorized to do business in the United States, and on the Navajo Nation, certifying that the applicant has a public liability insurance policy in force for the mining and reclamation operations pursuant to this Lease. Such policy shall provide for personal injury and property damage protection in an amount adequate to compensate any person injured or property damaged as a result of the mining and reclamation operations, including the use of explosives. Minimum insurance coverage for bodily injury and property damage shall be \$ 500,000 for each occurrence and \$1,000,000 aggregate.

(a) The Policy shall be maintained in full force during the terms of the Lease and the liability period necessary to complete all reclamation requirements under the Plan.

(b) The policy shall include a rider requiring that the insurer notify the Department and DOI whenever substantive changes are made in the policy including any termination or failure to renew.

32. The Lessee shall maintain a minimum 200.00 feet buffer zone with the San Juan River.

33. All employees of the Lessee shall be thoroughly familiar with the Lessee's emergency response plan.

34. The Lessee shall obtain the permission of permittees of existing mineral, oil and gas lease holders, operators and rights-of-way permittees when crossing these leases and rights-of-way.

SAN JUAN SAND AND GRAVEL PROJECT

EXHIBIT

2

San Juan Sand and Gravel Project Mining & Reclamation Plan

Appendix A – San Juan Chapter Resolution

B Appendix B – Land Designation Withdrawal Approval

C Appendix C – Land Survey and Project Maps

D Appendix D – Mine Plan Drawings

E Appendix E – Reclamation Plan Drawings

F Appendix F – Environmental Assessment

G Appendix G – Biological Resources Survey

H Appendix H – Cultural Resources Survey

I Appendix I – Solid Waste Regulations

J Appendix J – Relocation Plan

K Appendix K – NNEPA Confirmation Letter

L Appendix L – Evacuation Plan

M Appendix M – 401 Certification Permit Application

N Appendix N – MSHA Training Plan

O Appendix O – NPDES Permit Checklist

P Appendix P – Test Reports

Q Appendix Q – Lease and Access Road ROW

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SAN JUAN SAND & GRAVEL PROJECT PROPOSAL

Land Designation Withdrawal Package

Prepared by:
San Juan Sand and Gravel, LLC

February 7, 2017



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1. PROJECT SUMMARY

Project Name: San Juan Sand & Gravel Project Mining and Reclamation Plan

Mine Operator: San Juan Sand and Gravel, LLC
6991 E. Camelback Road, Suite B308
Scottsdale, AZ 85251
(480) 433-9760

Owner of Property: Navajo Nation
Lease to: San Juan Sand and Gravel, LLC

Location: The San Juan Sand & Gravel Project site is located along the southwestern bank of the San Juan River approximately 20 miles west of Farmington, New Mexico and 15 miles east of Shiprock, New Mexico. The entrance into the project site will utilize the Navajo Highway Route N36.

Section: The project site is in the San Juan County of the New Mexico
Township, and in the Navajo Nation in the community of the San Juan Community.
Range The Township is 29 North, Range 17 and 16 West.

Latitude and Longitude (at center of project): 36° 44' 29.87" N, 108° 34' 16.53" W

Directions to the site: From North Highway 491, the project site is located approximately 11.5 miles east along Navajo Highway N36 and exits off Navajo Route N366. Existing access to the project site is an unpaved dirt road with sufficient room for Right-of-Ways and easements into the mining facility. The undeveloped road is situated approximately midway on N366 along the Fruitland Irrigation channel.

Total Project Size Studied:	106 acres
Total Mining & Reclamation Area (lease acreage):	40 acres
Total area to be mined (1 st five-year lease):	22 acres
Total area to be reclaimed (1 st five-year lease):	22 acres
Total Processing Area:	18 acres
Quantity and type of material to be mined:	Sand & Aggregate (700,000 short tons)
Proposed start-up date:	Summer 2017
Proposed termination date:	Summer 2021
Proposed land use after reclamation:	Agriculture, grazing, and open space preserves.

2. INTRODUCTIONS

2.1 Plan Overview and Contents

The San Juan Sand & Gravel Project Mining and Reclamation Plan has been prepared in order to support an application for a mining lease for surface mining from the Navajo Nation in the community of San Juan Chapter in San Juan County, New Mexico.

The proposed project has been approved and supported by the San Juan Chapter Community by resolution number SANJ-2016-15 in reaffirming the San Juan Sand & Gravel Project (“SJSG Project”) and related efforts in mining and development of the Sand & Gravel business in the San Juan Chapter Community on December 13, 2015. Please see Appendix A for the approved San Juan Chapter Community resolution.

The proposed project plan addresses the excavation and processing of sand and aggregates on a 40-acre site during the first five-year mining lease period. The overall total sand & gravel tract surveyed, studied, and assessed is one hundred and six (106) total acres. During the first five-year lease period, twenty-two (22) acres of the forty (40) acres will be used to excavate the sand and aggregates, and the remaining eighteen (18) acres will be used as a processing area for the sand and gravel materials.

In addition, the SJSG Project has prepared the Environmental Assessment (“EA”) that assess the potential environmental consequences of the proposed mining, reclamation, and road activities, to ensure the affected stakeholders were involved in the processes, and to assist the decision makers by disclosing the potential effects of any proposed activities in the Project site.

The SJSG Project shall withdraw forty (40) acres of the one hundred and six (106) acres investigated and studied. The project shall be divided into several phases during the development of the mine and reclamation areas that lies within Section 12, T29N, R17W, & Section 07, T29N, and R16W.

The project is approximately 11.5 miles east of Shiprock, New Mexico and 20 miles west of Farmington, New Mexico. Approximately forty (40) acres of the project site will be directly disturbed by mining and reclamation operations, which includes the following: Administration & Shop, Surge Piles, Crush & Rubble Piles, Recycled Concrete Piles, Scale House, Sand Piles, Crusher, Conveyors, Wash Water Retention Basin, Parking, Fuel Storage, and Mine Entrance.

The Navajo Nation Sand and Gravel Lease have a maximum term limit of five (5) years. This 5-year plan is prepared in compliance with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation Departments and all applicable federal and tribal regulations will govern the mining and reclamation owner and operator of the sand and gravel mine and lease.

The reclamation plan for the SJSG Project would reestablish a productive ecosystem through revegetation and some habitat development, provide adequate safeguard of San Juan River fish resources, and achieve visual compatibility with the surrounding landscape.

The plan includes the backfill of an open-gravel mine pit sloping slightly below ground level and later stimulating the field for agricultural and residential uses. Any other pits created by mining operations would be modified to match the sloping elevations to the other pit and revegetated to create a productive ecosystem that are compatible with the adjacent desert area and surrounding habitat.

The mining on the project site would occur by schedule activities and reclamation would occur concurrently within those activities to the extent practicable.

The proposed project would preserve onsite areas of the Great Basin desert scrub plant community and the San Juan River desert habitat. Archeological sites would be safeguarded and notification will be given to the Navajo Nation Historic Preservation Department ("NNHPD").

The proposed mining and reclamation plan is a working document and a practical approach to reclamation of the project site. The recommended methods and criteria form the basis of construction and operational procedures for reclamation enhancement following the phased mining of the site and ultimate mining closure.

The San Juan Sand & Gravel Project Mining and Reclamation Plan includes the following chapters:

- Chapter 1: Project Summary
- Chapter 2: Introduction
- Chapter 3: Site Conditions
- Chapter 4: Excavation and Mining Plan
- Chapter 5: Reclamation Plan

The proposal when approved, will contains a copy of Navajo Nation Sand and Gravel Lease Application, appendices containing key technical reports referred to in the plan, and a copy of the environmental assessment. In addition, the appendices include a review of the plan's consistency with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease, and permit requirements prepared by the plan preparers.

2.2 Project Location

The SJSJG Project site is located along the southern banks of the San Juan River and approximately 20 miles west of Farmington, New Mexico and 15 miles east of Shiprock, New Mexico. The entrance into the project site will utilize the Navajo Nation Highway N36 and Navajo Route N366. Specifically, the project site occurs within New Mexico 7.5 minute USGS Quadrangle and lies within the Navajo Indian Reservation, and surrounded on both side by Township 29 North, Range 17 and 16 West, New Mexico Principal Meridian, New Mexico.

Please see Appendix B for the mine topography, legal survey and project location.

2.3 General Site Characteristics

The project site currently has areas of native habitants, farmlands, and an abandoned oil wellhead. The site is bounded by the San Juan River to the north and properties that support a variety of land uses including agricultural and rural residential to the south, east, and west. The project site is located next to an alluvial floodplain that was once the original channel for the San Juan River.

Nonetheless, this ancient channel was transformed a redirected due to the heavy amount of rainfalls in previous years to position the San Juan River flowing nearly sixty five (65) feet below project site elevation. The recommendations from the United States Army Corps of Engineers ("USACE") stated that mining activities be a minimum of 200 feet from the San Juan River at all times. This two hundred (200) feet distance will be the San Juan River buffer zone.

Topography of the project site is relatively flat with some uneven slopes along the banks of the river. The Fruitland Irrigation Canal runs adjacent to the project site's southern boundary. The project site runs generally east to west. The current areas do include runoffs and there is no riparian wetlands vegetation within the project site boundary. Outside the project boundary, there are some mature trees and dry vegetation existing on the west and southern banks of the site.

The Great Basin desert scrub vegetation occurs nearby to the San Juan River along portions of the project site's northern boundary. There are also several residences located near the project site and eventually some resident's maybe located if necessary, but no homesite's leases exist within the forty (40) acre project site.

The characteristics of the project site are discussed in greater detail in Chapter 2 (Site Conditions) of this plan.

2.4 Project Benefits

Navajo lands for the mine operations at SJSG Project is held in trust by the United States for the benefit of the Navajo Nation and mining provides important benefits to the Navajo Nation, including royalties and tax revenues, and employment opportunities for tribal members. The objective of the proposed project is to continue to provide those benefits to the Navajo Nation.

2.5 Project Activities and Timeline

The proposed project site would encompass approximately forty (40) acres, of which approximately 22 acres is proposed to be mind for sand and aggregates. The sand and gravel project area is projected to yield approximately 768,873 short tons of gravel, sand, and topsoil, or 394,227 aggregated tons of gravel. This includes approximately 143,355 cubic yards of topsoil (overburden) material that would be excavated and used in reclamation. The grand deposit is estimated at a thickness of twenty (20) feet in depth.

The project applicant's estimates' mining is projected to occur on the site for approximately 5 years per the Navajo Nation Lease Terms and Conditions. The sand and

gravel rate would be governed by the market demands and local competition. The estimated timeline would be adjusted based upon on these conditions.

The SJSG Project mining plan describes five distinct mining phases with the operations in each phase taking approximately one year to complete. The mining operations would use a variety of large machinery to transport overburden to a storage (or surge) pile, and mining the underlying aggregate. Diesel powered excavators would be used for the excavation of the mining pit areas near the groundwater table, while diesel powered loaders and trucks would be used for moving material on the project site from the excavators to the processing plant and excavating material above groundwater. The processing plant would be located in relation to the mining phases on the project site so that access and transportation distance between the pits and processing plant would be minimized during the mining phases.

The sand and gravel excavated would be processed using a motorized crusher, followed by screening and washing the materials to different sizes. The processed material would become available to the local and regional markets to be used in the general construction of projects using concrete aggregate for the construction of foundations for residential, commercial, industrial, agricultural buildings and structures, and miscellaneous aggregate products and highway developments.

Any uses of Navajo Nation's water require a permit from the Navajo Nation Water Resources Department ("NNWRD"). San Juan Sand & Gravel, LLC is consulting with the NNWRD – Shiprock Office to determine type of permit needed.

The processing area will not be mined, but the mined areas would be reclaiming as farm and, or agricultural lands. Overburden or native material would be used to develop the side slopes of the pits and dikes to ensure successful revegetation and erosion. The mining would be done in phases, starting at the west end and the mining pit would be developed on the east side of the crushing operation. All mining activities would occur in during the 5-year lease term and the renewal of the lease will start one year before the end of lease date, or until all mining activities are completed.

During mining and reclamation phases of the proposed project, the agricultural operations will start in those fields that are not involved in the mining process, or areas of reclaimed phases. The final configuration of the reclaim land will depend on the conditions of the mining operation and the available amount of overburden. Conditions that would contribute to the final reclamation of the proposed project are volume of overburden, depth of groundwater and volume of material removed for processing.

2.6 Background Information

2.6 a. Previous Mining Activities

The proposed project would be located along a stretch of the San Juan River that moderately mined for aggregate in the mid- to late-1900s by small individual and state mining operators. No mining activities have occurred on the project site since the mid 1900s when ranching and farming replaced mining activities. Please see the Section 3, Site Conditions for a more detail description of past uses of project site.

2.7 Owners of Surface Mining Interests

The surface & subsurface lease to:
San Juan Sand and Gravel, LLC.
6991 E. Camelback Road, Suite B308
Scottsdale, AZ 85251

The operator is:
San Juan Sand and Gravel, LLC.
6991 E. Camelback Road, Suite B308
Scottsdale, AZ 85251

Company Ownership

San Juan Sand and Gravel, LLC will be registered as a Limited Liability Company ("LLC") under the laws of the Navajo Nation Limited Liability Company Act and registered with the Navajo Nation Business Regulatory Office and all applicable Navajo Nation laws shall govern and take precedence.

3. SITE CONDITIONS

3.1 Existing Land Use

3.1 a. Project Site

The present land use for the proposed project area is primarily grazing with agricultural row crops adjacent to the southern boundary of the project site. The southern boundary of the site is also 100-150 feet from an irrigation channel. The southern primary crops grown on the southern fields are alfalfa, corn, and oats. The property also sits near abandoned oil pumping station and capped oil fields. Unpaved and underdeveloped dirt roads, and homes on the south and southwest sides exist on the project site.

A Navajo Tribal Utility Authority ("NTUA") 13.8kV electric and water distribution lines run northwest-southeast through the site, generally following an unimproved dirt road that provides access to the site and ends at the San Juan River. Other smaller unimproved roads traverse portions of the site and its boundaries. The San Juan River lays 100-150 feet north of the project site adjacent the northern project boundary. However, a minimum two-hundred (200) feet buffer zone will be maintained with the San Juan River.

3.1 b. General Plans and Area Information

The San Juan Chapter Land Use Plan designates the project area as Commercial /Industrial Business ("CB"). The properties that make up the project site are planned as Agriculture Business ("AG") and CB once mining has been reclaimed. The plan allows for surface mining and site reclamation site areas during the issuance of a Mining Lease Permit ("MLP"). The mining and reclamation plan will be in compliance with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease.

3.1 c. Mineral Resource Classification

The Navajo Nation Minerals Department ("NNMD") Geologist issued a basis of geologic factors that classifies the mineral resource project area; without regard to existing land use and land ownership is defined as "alluvium". A field survey of the area was conducted of the project area where a sufficient feature indicates there is a significant mineral deposits present or where it is judged that a high likelihood exists for alluvium presence.

3.1 d. Surrounding Land Use

The lands surrounding the project site to the south, north, and west are primarily rural residential properties, some of which are used for ranching and farming activities. The proposed mining site is bordered on the north by the San Juan River. The land across the river from the project site is the community of Hogback enhanced with residences, ranching and agricultural fields. The properties to the south of the site are used for agriculture with row crops and agricultural fields. In either direction of the project site sits rural residences and agricultural and grazing fields.

There are no residences within the project area (40 acres) and the community of San Juan Chapter has accepted the proposed project by a supporting resolution.

3.1 e. Aesthetics

The existing visual character of the site is that of an open grazing field with power lines dividing the site. Scattered vegetated buffers exist along the San Juan River north of the site. Currently, a visual relief of alluvial fields exists that dominate the site's visual environment.

The proposed operations would not be visible from Navajo Highway N36 due to the slope in elevation from road to the mining operations. Most of the surrounding residences would have obstructed views of the operations due to existing vegetation and constructed spur dikes. There will be some slight views from all directions, but vegetated spur dikes will impair it. The project site is situated on a bluff at a higher elevation than the San Juan River.

3.2 Geologic Description

3.2 a. Geologic Setting

The assessment area for geology include the San Juan River to the north, the Hogback Cliff Sandstone ("HCS") to the East, the Chaco River to the south, and the Chuska Mountains to the west. The Project site would be located on the Colorado Plateau physiographical unit within the San Juan Basin. The San Juan Basin consists of horizontal layers of sedimentary materials deposited during shifting depositional environments of a shallow inland sea during the late Cretaceous to early Tertiary Periods.

Published geologic maps prepared by the United States Geological Survey ("USGS") and New Mexico Geological Survey ("NMGS") indicate that the site and surrounding area is underlain by a visible surface materials are present within the geological resources assessment area that includes the Quaternary period alluvium and Aeolian sand deposits.

Sand Formations

The Project area has Cretaceous age alluvial deposits with Pictured Cliff Sandstone ("PCS") and Lewis Shale Formations. Ancient rivers that deposited in a swampy delta plain and backed beach environment deposited the sedimentary material. The PCS consists of alternating sandstone, gray siltstone, and mudstone, beds that inter-fingered with the Lewis Shale Formation ("LSF"). The Lewis Shale Formation consists of silty marine shale with inter-bedded limestone, sandstone, and clays. Both are members of the Mesaverde Group of the Cretaceous age.

The deposits are generally unweathered to slightly weathered and up to about twenty five (25) feet in maximum thickness. Features of the PCS and LSF exist within the proposed phases of the mining area.

3.2 b. Topography and Landform

The entire project area encompasses approximately 106 acres, but only 40 acres will be mined and reclaimed. Within this project area, the surface gently slopes at 1% to the north, and the area can generally be characterized as being relatively open valley bordered by a series of terraces which extend to the upland plateaus in an ancient floodplain with relatively flat agricultural and grazing fields. Elevation within the project site range between 5,025 and 5,045 feet above mean sea level. The San Juan River is located along the northern boundary of the project area with the Fruitland Irrigation Channel running along a portion of the southern boundary of the project site.

3.2 c. Soil Types Soil Characteristics

The United States Department of Agriculture (“USDA”) Soil Conservation Service (now Natural Resources Conservation Service (“NRCS”) conducted an Order 3 soils survey in 1980 (NRCS 1980) and another Order 3 soil survey, entitled, Soil Survey of Shiprock Area, Parts of San Juan County, New Mexico and Apache County, Arizona (NRCS 2004). The soil survey area are formed from alluvium and aeolian sediments derived from shale and sandstone. Some soils are formed in place and are considered residual.

The surveys generally followed the taxonomic system utilized by the NRCS and focus on identification of soil mapping unit’s salvageable topdressing materials within the survey area (topdressing refers to all unconsolidated materials capable of supporting plant growth in the upper 60 inches of the native in-situ soil profiles.)

Soil throughout the site indicate the following soils: silty gravel (“GM”); silty sand (“SM”); sandy silt/silty sand (“ML/SM”); silty sand/sandy silt (“SM/ML”); silty clay (“ML-CL”); and lean clay (“CL”). These soils extend to depths ranging from three (3) feet beneath the surface to eight (8) feet. The granular soils were typically loose to medium-dense, while the fine-grained soils were typically soft to medium stiff. Beneath the surficial soils are dense to very dense gravel granular materials including well-graded gravel (“GW”), poorly graded gravel with sand (“GP”), and silty gravel (“GM”). Poorly graded sand (SP), silty sand (SM), clay sand (“SC”), silty gravel (“GM”), lean clay (“CM”), and sandy tuff were present beneath the gravels to a depth of 25 feet beneath grade (maximum exploration depth). The in-place relative density of the granular soils typically ranged from medium dense to very dense. The soils encountered are encountered a depths ranging from 4 to 28 feet.

These soil types and characteristics were observed visually and have an estimated reserve in the potential excess of one million yards of minable material by Craig Wickstrom, PE, Geological Engineer. The visual analysis can be seen from the following random images of the project site below:



Figure 1 - Northwest corner of proposed project site.



Figure 2 – Northern boundary of proposed project site.



Figure 3 – Eastern boundary of proposed project site.



Figure 4 – Alluvium presence on Project Site.



Figure 5 – More Alluvium presence on Project Site.



Figure 6– Northwest corner of Project Site.



Figure 7 – Northwest corner of Second Phase of Project Site.



Figure 8 –Northern Boundary of Project Site.

3.2 d. Description of Aggregate Deposits County

The local Geologist has classified mining areas in San Juan County covering 1,000± acres as alluvial aggregate. Concrete-grade alluvial aggregate occurs in streambeds, flood plains, terraces, and channel bars along and adjacent to the major streams and rivers in San Juan County. The San Juan River drainage basin and its tributaries in particular, have extensive deposits of concrete-grade alluvial aggregate resources.

The San Juan River in this area overlies the lower Pleistocene Mancos Shale Formation and/or the Pliocene Kirtland and Upper Cliffs formations. The active river channel in this area has abundant alluvial sand and gravel deposits. Adjacent off-channel elevated alluvial terraces that border the active river channel also contain significant amounts of hard, durable Holocene and Pleistocene sand and gravel resources. Past sand and gravel mining in this area have reached depths in excess of twenty (20) feet. Average sand and gravel thicknesses are assumed to be about twenty (20) feet beneath a soil/clay overburden that typically mantles the terraces. Overburden generally varies from less than two (2) feet to more than eight (8) feet. Areas along the San Juan River and its adjacent terraces are within the San Juan River; alluvial boundaries have been extensively mined for aggregate since the early 1900s. An estimated of 500± acres or more has been depleted.

Project Site

SJSG will excavate for sand and gravel. A soils contractor at various locations will conduct soil testing across the SJSG Project site. A soil bore log will be kept to show that the aggregate was encountered at depths ranging from zero (0) to thirty (30) feet below the ground surface.

Aggregate deposits typically is mixed with silt and sand in varying proportions. Overburden found above the aggregate deposits was identified in the bore logs as consisting of a variety of materials including lean clay, sandy silt, silty sand, and silty clay. Materials encountered beneath the aggregate deposits included Mancos Shale Formations, lean clay, clay sand, clay and tuft, tuft, and sandstone.

3.2 e. Seismic Considerations Faulting

The site is not located within an Earthquake Fault Zone designated by the State of New Mexico. Although there are no active faults breaking the ground surface, interpretations of associated geologic structures indicate that large volcanic activities likely have occurred on the order of tens of thousands of years, and are not considered to be possible sources of significant earthquakes.

Historical Seismicity

San Juan Chapter, San Juan, New Mexico is located within an area of low seismic activity relative to other areas of New Mexico. According to the New Mexico Building Code ("CBC", 2006 edition) the site is located in Seismic Zone 2. The peak ground acceleration ("PGA") with 2% Probability of Exceedance in fifty (50) years at this "alluvial" site is 0.1g as depicted in the following diagrams below.

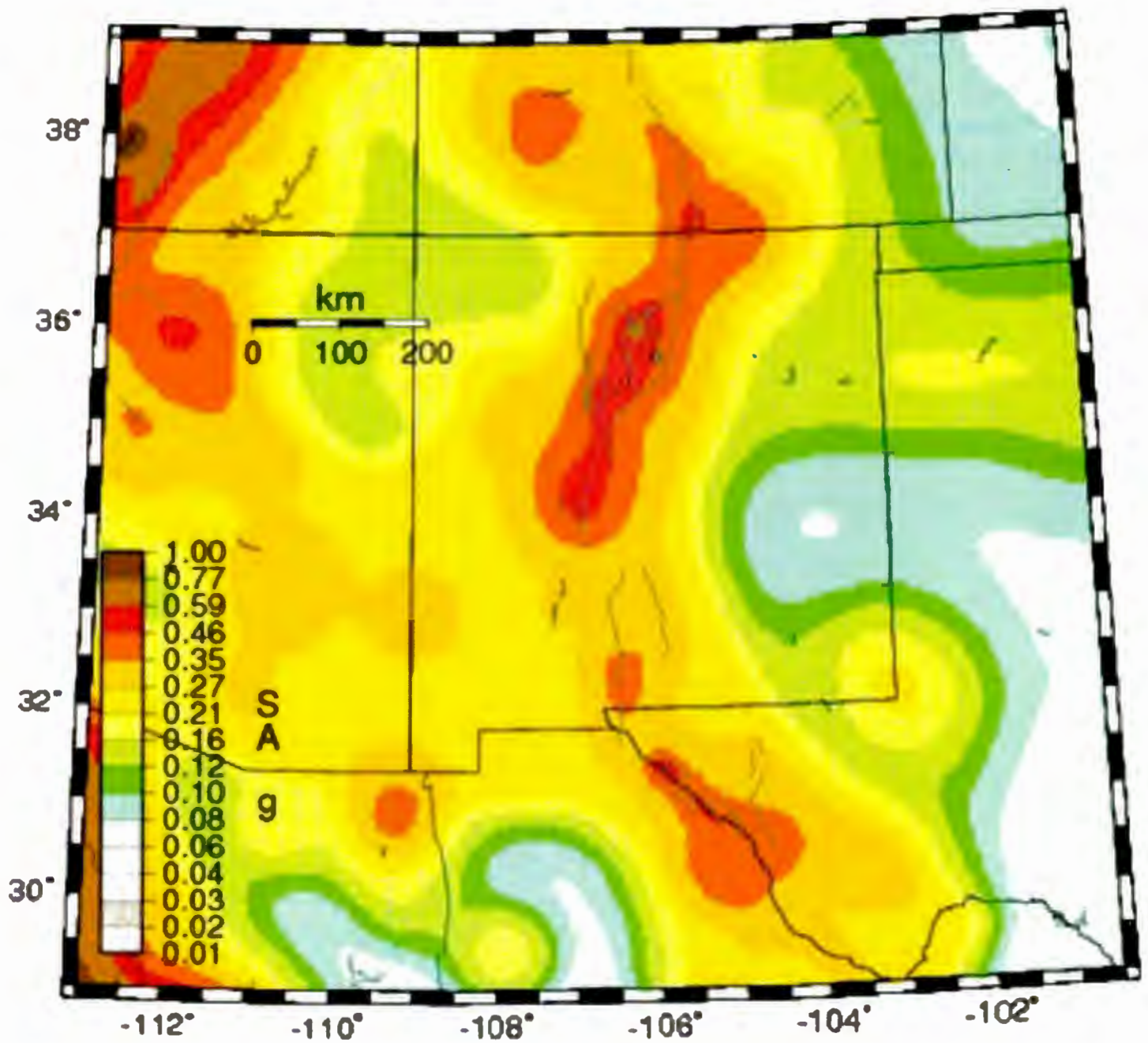


Figure 9 – NM & W. Texas 2008 5-Hz SA w/2%PE in 50 yr.

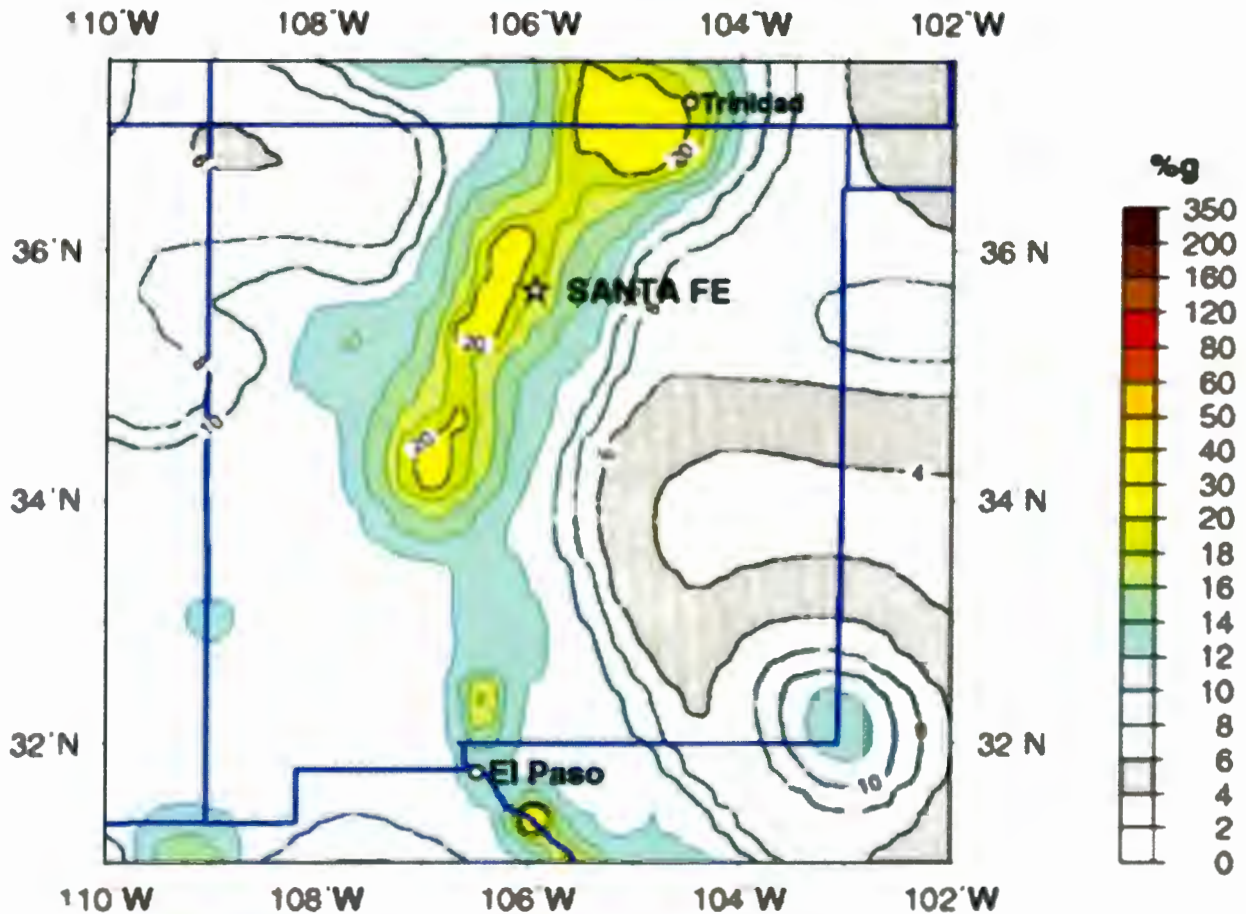


Figure 10 – Peak Acceleration (%/g) with 2% Probability of Exceedance in 50 Years

Relative to historical seismicity, Table 1, indicates that two M5 or greater earthquakes, and none of M6 or greater, have been reported to have occurred within about 280 miles of the site during the period of 1900-2010. Table 1 lists these earthquakes, dates of occurrence, and respective distances from the site.

Table 1			
SIGNIFICANT HISTORICAL EARTHQUAKES			
Date	Magnitude (M)	Approximate distance & direction from site (miles)	Location (Approx.)
07-12-1906	5.8	280 SE	Socorro
11-15-1906	5.8	280 SE	Socorro
01-23-1966	5.1	100 E	Dulce
08-10-2005	5.0	390 E	Raton
12-19-2005	4.1	480 SE	Carlsbad

Source: New Mexico Tech Seismic Network: Seismology In New Mexico Website, Earthquakes in New Mexico

Liquefaction

A variety of factors can influence liquefaction potential, including soil type, grain size, relative density, soil age, depth to groundwater, and intensity and duration of ground shaking. Soils most

susceptible to ground shaking are saturated, Holocene-age, and consist of loose clean sand and silty sand.

The potential for an earthquake with the intensity and duration characteristics capable of promoting liquefaction is a possibility during the design life of the project. Additionally, relatively clean granular soils are common in the subsurface.

Seismic Design Considerations

The site is in a region of low to moderate seismic activity, but could be subjected to strong ground shaking during the life of the project. As a result, facilities at this site should be designed in accordance with applicable seismic provisions of the building codes. Structures should be designed for lateral force requirements as set forth the CBC (2006). Parameters for input to seismic modeling are provided on the basis of information contained in the CBC Design Basis Earthquake (“DBE”).

3.3 Present Site Use and Conditions

3.3 a. Agricultural Land Uses

The low agricultural uses on the proposed project site consist of row crops. The primary crops grown on the reclaim lands after sufficient settling will be alfalfa, corn, and oats.

3.3 b. Natural Resources

Terrestrial Biological Resources

The following information is based on a biological resources survey conducted by Ecosystem Management, Inc. Vegetation within the project site has been classified as Great Basin desert scrub plant community as defined by Dick-Peddie (1993). The soils are not listed as hydric soils by the NRCS. There're no riparian or wetlands areas within the project site. The San Juan River, a perennial water body, is located adjacent (i.e., North) to the project area, but is physically separated due to the elevation difference created by the steep banks.

The dominant plants are four-winged saltbush, Russian thistle, rabbit brush, broom snakeweed, brome, Indian rice grass, alkali sacaton, kochia, prickly bear, many-headed groundsel, and big galleta grass.

Some noxious weeds observed were Halogeton and salt cedar, which BIA classed as Noxious Weed Class B and C weeds.

The Biological Evaluation list protected species are potential to occur in the project area. This is obtained from Navajo Nation Department of Fish and Wildlife (“NNDFW”). In addition, the potential for twenty (20) species of concern to occur within the project area have to be evaluated.

Aquatic Biological Resources

Listed fish species known to occur within the San Juan River includes the Colorado Pike Minnow and Razor Suckerback Critical Habitat, but constitute elements of the critical habitat are not on the project area, so project will not affect those species.

There will be no impacts to any “Waters of the U.S.” from the proposed project. Consequently, neither a Clean Water Act (“CWA”) Section 401, or a Water Quality Certification, nor a Clean Water Act Section 404 permit will be required.

3.3 c. Surface and Groundwater Characteristics

Surface Water

The surface water resource is the San Juan River, which runs adjacent to the project site. This river benefits the local agricultural fields in the surrounding communities. There are no characteristics of surface water resources within the project site and consultation was made with Navajo Nation Environmental Protection Agency (“NNEPA”) and Ecosystem Management, Inc., which determined this project site, as no threatened or endangered species will be impacted.

Groundwater

Groundwater in the project site is heavily influenced by the hydrology of the surface water bodies and soil characteristics. Sole source aquifers per the Safe Drinking Water Act must be designated and identified to supply more than 50% of a community’s drinking water and must be the only available local and regional source of drinking water. The Navajo Nation does not have any designated aquifers on this project site. The project and surrounding residences are supplied by a water system, maintained by the NTUA.

3.4 Archaeological and Historical Resources

The site was investigated in 2007 by Hammerstone Archaeological Services (“HAS”) and the Navajo Nation Historic Preservation Department (“HPD”) and archaeological and cultural resource compliance has been permitted with some conditions to be met during disturbing ground activities. The archaeological and historical investigation conducted is a class III cultural resources survey of the 106 acres located on the San Juan Chapter of the Navajo Nation, San Juan County, New Mexico. Of the 106 acres, SJSJ will only use forty (40) acres.

Three previously recorded archaeological sites and seven isolated occurrences were discovered within the proposed project area and it has been determined that there will be no adverse effect by the proposed project undertaking. The three-recorded sites are NM-H-20-140 (LA 5740), NM-H-20-141 (LA 8398), and NM-H-20-142 (LA 8399) are recommended to be possibly eligible for inclusion to the Register of Historic Places under criterion D, information potential (36 CFR 60.4). These sites contain materials that are greater than 100 years old and are of archaeological interest and therefore warrant protection under the Archaeological Resource Protection Act. The site does not warrant protection under the American Indian Religious Freedom Act, as they cannot be related to a specific religious expression.

The seven isolated occurrences identified are not likely to yield significant data towards our present understanding of the prehistoric or historic periods of the region. Therefore, the isolates do not require any further investigation.

The project site is recommended prior to any ground disturbing activities; a qualified archaeologist will flag the recorded sites boundaries. Sites will be monitored during fencing activities and ground disturbances. A fifty (50) foot buffer is recommended from recorded site

boundaries. The monitoring at the sites during construction activities will be documented and submitted to NNHPD within 30 days.

3.5 Air Quality

Climatology

San Juan County is located near the northwestern end of New Mexico's has mountain ranges existing to the north and west of the project site at various elevations and influence climatic conditions. The climate condition is relatively arid to semi-arid. The project site does experience all seasons.

The annual precipitation ranges from a few inches to less than ten inches. The average annual temperature is about 51 degree Fahrenheit, with cold winters (October – March) and hot summers (April – September).

Project Emissions and Permitting Requirements

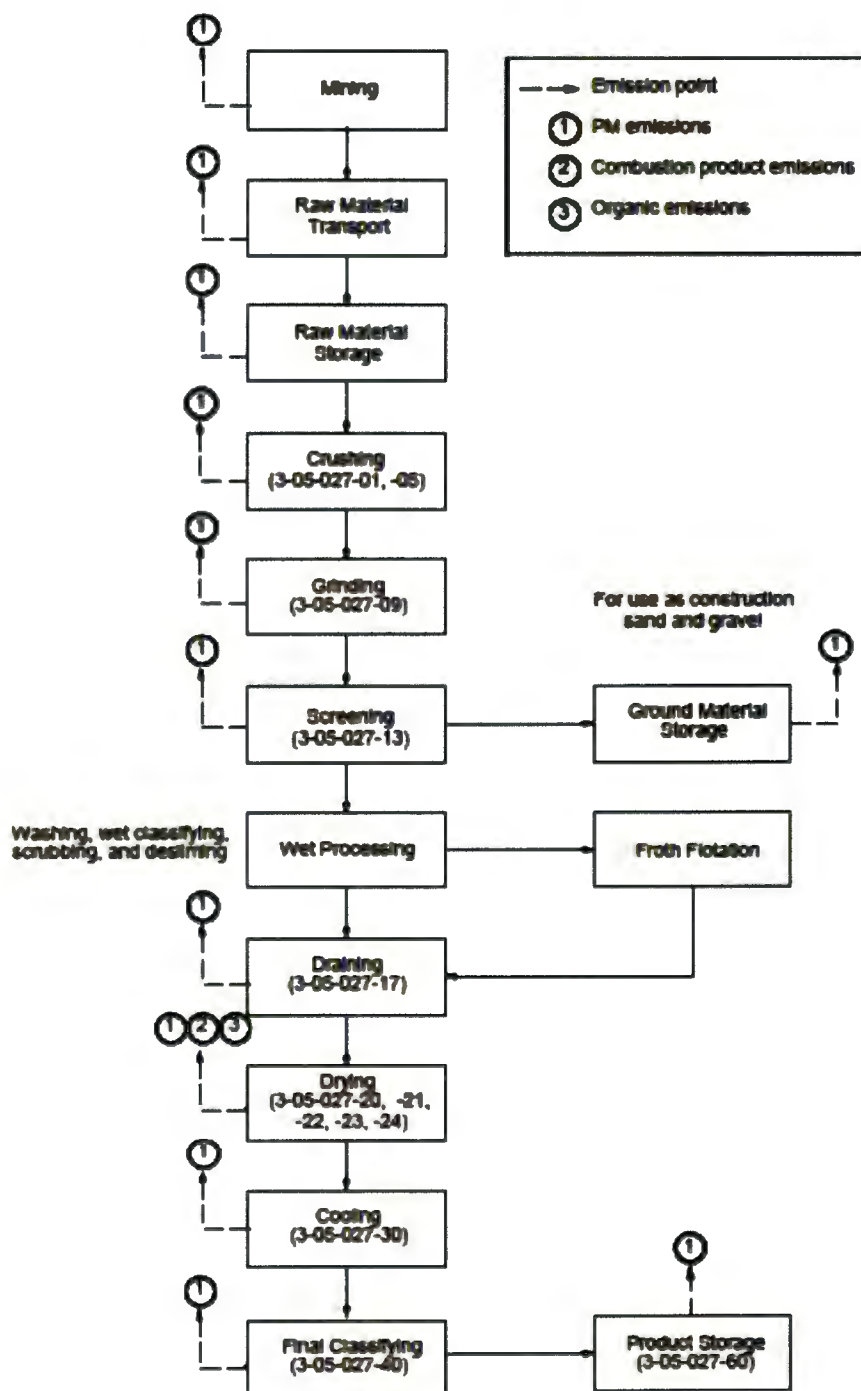
Mining projects generally affect air quality by producing small particulate matter ("PM10"), and nitrogen oxides (NOx). Particulate matter is generated by the active disturbance of earth during mining activities, and NOx is generated by the combustion of diesel fuel used in heavy-duty mining equipment. PM10 is standard that focuses on smaller particulate matter that likely responsible for adverse health effects, because of their ability to reach the lower regions of the respiratory tract. PM10 standards include particulate mater with a diameter of 10 micrometers or less (0.0004 inches, or 1/7 the width of a human hair). PM10 standards are under review whether revisions to the current PM10 standards are warranted. NOx react with organic compounds in the air to form ozone, which is also a criteria air pollutant. The Navajo Nation Air Quality Program and NNEPA set standards for criteria pollutants. The Navajo Nation standards are usually more stringent than the federal standards.

A further detail of PM10 emissions is depicted in Figure below. Emissions from the production of sand and gravel consist primarily of particulate matter less than 10 micrometer in aerodynamic diameter, which are emitted by many operations at sand and gravel processing plans, such as conveying, screening, crushing, and storage operations. Generally, these materials are wet or moist when handled, and process emissions are often negligible. A substantial portion of these emissions may consist of heavy particles that settle out within the plant. Other potentially significant sources of PM10 emissions are from the haul roads.

The Navajo Nation Air Quality Control Program ("NNAQCP") program has permitting authority over the proposed project. A source must comply with all Navajo Nation requirements before operating in the Navajo Nation. The NNAQCP was contacted to determine what permitting requirements would apply to the proposed project. The material excavated at the proposed project site would be processed on-site at a newly constructed processing plant.

In order to build and operate this plant, the applicant would not need to obtain an "Air Permit" to from the Navajo Nation. The Navajo Nation can monitor the project site from time to time. If increases in processed material from the proposed project would cause the plant to exceed its permitted production levels, then "Permit" is needed.

Any portable equipment, such as internal combustion engines that would remain in one stationary location for more than six months, would also be considered stationary and would need a "Permit". For such equipment, the facility would be required to list the equipment and the expected hours of operation.



3.6 Hazardous Materials

At any phases of the mining operation, the Navajo Nation Solid Waste Management Program (“NNSWMP”) coordinates and monitors all hazardous materials on the Navajo Nation under the Navajo Nation Solid Waste Regulations. These regulations are adopted pursuant to Navajo Nation Solid Waste Act 4 N.N.C. §§101 et. Seq., as amended by the Navajo Nation Council Resolution No. CJY-51-97. The purpose of these regulations is to protect the health and welfare of the present and future citizens of the Navajo Nation by providing for the abatement of air, land, and water pollution and other public health and environmental hazards related to waste management.

The proposed project will not produce, use or store any hazardous materials, therefore will not require mitigation measures. The sand and gravel operation plans to address the removal of hazardous material off the Navajo Nation per the guidelines set within the NNSWMP. All mining contractors will comply with these rules and guidelines. Mine operators and contractors will use only mine haulage and access roads.

All minerals will be sampled and tested per the guidelines set forth by the American Society for Testing and Materials (“ASTM”) to meet criteria for construction needs.

3.7 Transportation

Existing access to the project site is a narrow, unpaved underdeveloped dirt road on the east side of project site that exits to the south to Navajo route N366. There are no traffic signals or stops signs within close proximity to the driveway access, and there are no posted speed limit along the segment of Navajo route N366. Further traveling on Navajo route N366 to the south for 1.8 miles that enters to Navajo highway N36.

U.S. Highway 491 is located approximately 11.5 mile west of the project site. U.S. Highway 64 is located approximately 13 miles northeast from the project site. U.S. Highway 550 is located approximately 16 miles east from the project site. All three highways provide regional access to the site and are two-lane arterials. Average daily traffic volumes along roadway segments and intersections closest to the project site can be found with the Navajo Department of Transportation (“NNDOT”), Bureau of Indian Affairs (“BIA”) Roads Department, or the New Mexico Department of Transportation (“NMDOT”).

3.8 Utilities and Services

The following list of agencies provides public or private services or utilities to the project site.

- Fire Protection: San Juan County Fire Department
- Law Enforcement: San Juan Sheriff’s Department & Navajo Nation Police Department
- Electricity: Navajo Tribal Utility Authority
- Natural Gas: Navajo Tribal Utility Authority
- Water: Navajo Tribal Utility Authority & Navajo Water Resources Department
- Wastewater: Navajo Tribal Utility Authority
- Solid Waste: Private Disposal Service
- Telecommunication: Frontier Communications & Sacred Wind
- Roads: Navajo Nation Department of Transportation & New Mexico DOT

4. EXCAVATION AND MINING PLAN

4.1 Excavation and Mining Overview

Proposed mining and reclamation operations on the SJSG Project site would be carried out by San Juan Sand and Gravel, LLC. The project site encompasses forty (40) acres that will directly affect by mining, processing, and reclamation activities. Portions of the forty (40) acres will serve as setback areas or buffers from adjacent properties and support a variety of uses including continued agricultural production and habitat reserves if any.

Materials mined onsite would consist exclusively of aggregate (sand and gravel). Aggregate mined on the SJSG Project site would be washed, crushed, screened and graded on-site, and transported off-site for use in the production of asphalt and concrete. These end products are generally associated with new home and roadway construction, but they would also be used by public agencies to improve existing infrastructure.

The proposed SJSG Project mining operations will follow the guidelines established by compliance with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease. All mining activities will follow the plan as specified.

The mining methods that would be employed at the SJSG Project site follows the following sequence, with step 4 through 8 repeated for each mineable phase area:

1. Removal of any available vegetation.
2. Removal of any available topsoil.
3. Removal of any available overburden.
4. Excavation of sand & gravel.
5. Transport of sand & gravel to processing area.
6. Crushing of aggregates.
7. Washing of aggregates.
8. Complete mine and reclaim areas.

The sequence of mining activities will move in an eastern direction within the lease and permit area.

The site will be mined in several phases, with each mining phase taking from 1 to 2 years to complete. It is understood that the mining permit has a maximum term limit of five (5) years and can be renewed. The overall proposed project will have a project lifetime of twenty-five (25) years to complete, with mining activities scheduled with the five (5) year term period. The reclamation of any given phase will commence as soon as the mining operation allows.

Reclamation and mining will be done concurrently, to the extent possible, but reclamation will begin no later than at the completion of each phase. The mining operation will begin within one year of Navajo Nation approval of the Lease Permit and Reclamation Plan and could be completed by five (5) years with the reclamation completed within 5 years after all mining activities are completed. This schedule, however, is uncertain and would be controlled by the local demand for aggregate products.

4.2 Materials to be Mined

4.2 a. Overburden

“Overburden” is the material lying above the aggregate deposits that would be mined and processed under the proposed mining and reclamation plan. Overburden on the San Juan Sand & Gravel Project site varies in nature depending on its location on-site, but is generally a mix of clay, silt, sand and topsoil that is relatively rich in organic materials. Much of the project site has historically supported the grazing and production of row crops.

According to soil surveys, overburden on the SJSG Project site is generally one (1) to eight (8) feet deep. In the course of proposed mining operations, overburden will be removed and used for a variety of purposes in support of mining or site reclamation. Overburden will be used in the construction of proposed flood-control and construction uses. Overburden will also be used for back fill in excavated pits after mining activities are complete. Overburden will also provide the growth medium for proposed reclamation revegetation activities.

To the extent possible, overburden will be moved directly to its final planned location immediately after excavation. Toward the end of the last phase of planned mining operations, however, it may be necessary to temporarily stockpile some overburden in order to complete final site reclamation. If stockpiling is necessary, stockpiles will be managed to minimize water and wind erosion. Any stockpiles will receive an application of hydro seed/mulch to stabilize the slope as determined by the Erosion Control Plan (“ECP”).

The reclamation plan sets out to reclaim approximately twenty-two (22) acres of land for agricultural use with the adequate supply of overburden. See Table 2 for tons in each phase and Table 3 for volumes in each phase.

4.2 b. Aggregate (Sand and Gravel)

The aggregate layer is under the overburden layer and the thickness of the aggregate layer generally average eight (8) feet deep on the project site. The aggregate material is well graded across the site, ranges from #16 sand to 6 inch and larger cobbles. See Table 2 for tons and Table 3 for volumes in each of the five proposed mining phases.

Table 2 (Imperial & Metric Tons)					
Mine Lease Term	Phase	Year	Acres	Metric Tons	Short Tons
1st(5yr)	1A	1	5.29	163,586	183,216
	2A	2	3.89	120,133	134,549
	3A	3	3.80	117,416	131,506
	4A	4	4.75	146,642	164,240
	5A	5	4.49	138,714	155,359
Processing Area	PROC	-	17.78	-	-
TOTALS			40	686,493	768,873

Table 3 (Metric Volumes)					
Mine Lease Term	Phase	Year	Acres	Overburden (cu.yd.)	Aggregate (cu.yd.)
1st (5yr)	1A	1	5.29	34,160	93,941
	2A	2	3.89	25,086	68,988
	3A	3	3.80	24,519	67,427
	4A	4	4.75	30,622	84,211
	5A	5	4.49	28,966	79,658
Processing	PROC	-	17.78	-	-
TOTALS			40	143,355	394,227

4.3 Mining Operation Plan

4.3 a. Operation Overview

The mining of the site will be completed in three phases. The summary of materials to be mined for each phase is given in Table 2 and Table 3. The mining operation is to occur in the phases or order from west to east. However, some overlap may occur between phases due to overburden requirements of the dikes and the first phase reclamation. In addition, the operator could change the phasing schedule to meet operating conditions or market demand for the material. The project life of the operation is from 23 to 25 years and many future factors affecting market demand for the material would alter this projection. It is recommended that this not be a condition of the permit.

Another factor that will determine the amount of material to be removed is the quantity and quality of the aggregate in the gross excavated material. The depth of mining will vary with the depth of the material. Generally the maximum depth of cut will be up to twenty (20) feet below ground surface, but it is possible for the maximum depth of cut to reach thirty (30) feet in a few areas. Slopes of excavation will vary from 5H: 1V to 3*H: 1V in these areas.

4.3 b. Approaches to Mining and Excavation

The mining and excavation of each phase shall begin with the removal of the topsoil and overburden material. This material will be used for construction of dikes, or used immediately for reclamation in previously mined areas. As discussed above, in the final phase of proposed mining activities, it may be necessary to stockpile some quantities of overburden to support final site reclamation.

After the removal and placement of overburden materials, the mining and processing of underlying aggregate materials will begin. The mining starting point begins at the west end of the project site and nearly east of the processing area following a mining process in the eastern development direction to the end of the project site.

The proposed approach to overburden and topsoil removal and aggregate extraction for the term lease will be the same for the next proposed lease area. Overburden in the mining area will be removed in all the mining phases of the project site. This removal will be done in order to efficiently accommodate the backfilling of the mining pit as mining proceeds.

At the start of mining operation, overburden will be scraped and stockpiled or used for the construction of proposed, "overburden dikes" adjacent to the northern boundaries of the project site. As mining proceeds, overburden from this pit will be moved into previously mined areas of the mine. As mining advances to the east, mine spoils will be used for reclamation with the stocked overburden/topsoil placed on top.

All topsoil will be relocated near the processing area for storage until reclamation starts. Surplus overburden will be used for backfilled for the mining pit.

With the start of each mining phase, all overburden used as barriers or stockpiled. Once mining is completed in each phase, and then the mine spoils will be returned and covered with overburden and topsoil. This process will continue until the aggregate is mined out.

If mining would occur below the groundwater level, it wouldn't be necessary to dewater the mining pits in order to excavate all of the available aggregate. The mining operators aren't planning on excavating below any groundwater levels.

The mining plan is designed to have little or no impact on the surrounding areas through the use of setbacks and set-aside areas. The use of water on the site for irrigation of agricultural crops on land proposed for future phases will be routed around the mining operation. The mining operation will result in small amounts of dust that is to be controlled through the use of water trucks or dust suppressants.

As noted, the overburden/topsoil will be used in the creation of dikes during mining and the reclamation plan includes preventive measure from floodwaters entering the pits. The overburden/topsoil will also be removed and used in the development of the eighteen (18) acres reclaimed. The side slope areas of reclamation areas will have a re-vegetation seeding program as outlined in the reclamation plan.

Please see Appendix C for the mine plan development directions and cross sections.

Slope Engineering

During the operational phases, the stability of high wall, spoils, and stockpiles shall be maintained in order to prevent slope failures that would cause serious injuries to mine personnel. The final reclaim slope of each phase shall not be greater than 5 (Horizontal): 1(Vertical).

4.3 c. Employees and Equipment Use

A maximum of nine (9) employees will be employed to operate the various types of equipment and machinery on the project site. The equipment to be used for the mining and excavation of materials will generally be diesel-powered, hydraulically operated wheel and track-mounted machines. The following equipment will be used on the project site:

- one water truck for dust control;
- two front-end loaders to feed the crusher and load trucks;
- one hydraulic excavator to harvest raw material from extraction areas;
- three off-highway trucks to transport raw material from extraction areas to the processing area;
- two self-loading scrapers to remove overburden and transport overburden to backfill Phase I extraction site;
- one track dozer to level fill at Phase I extraction site; and
- one 750-kilowatt diesel generator to power crushing equipment.

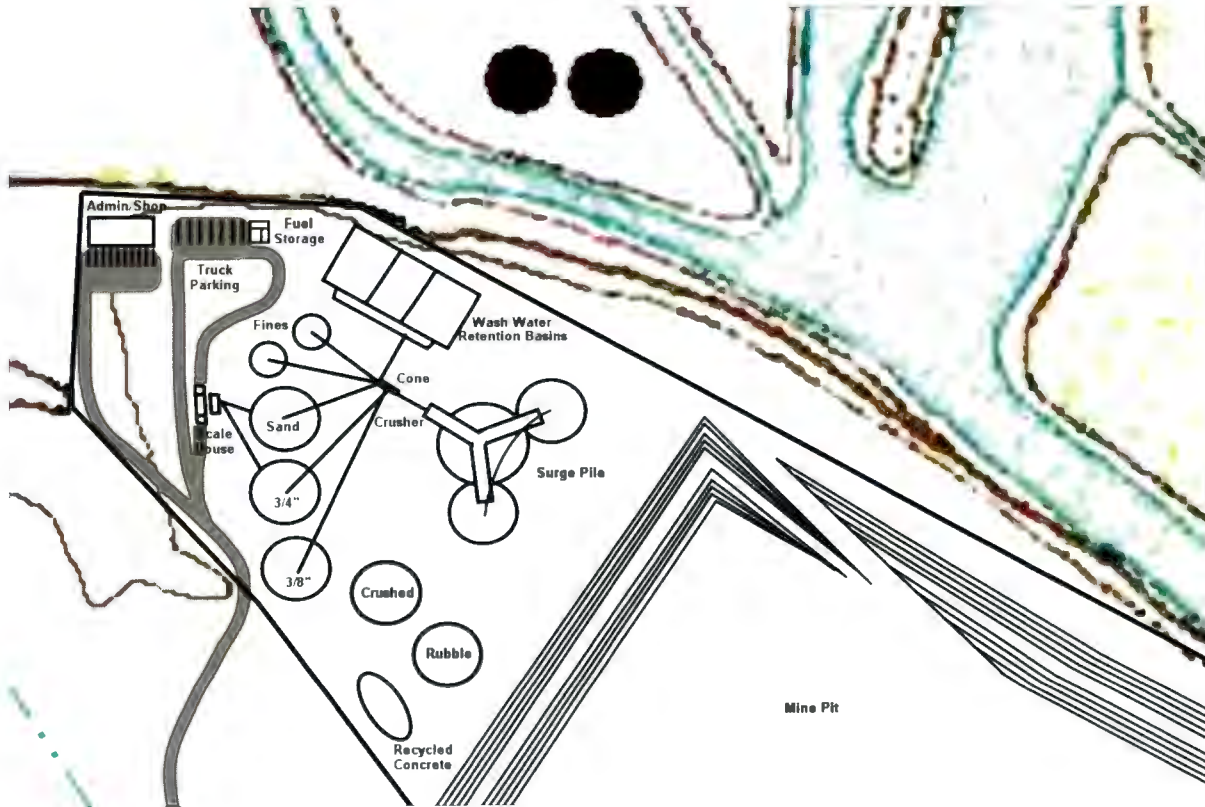


Figure 11 – Processing Area Layout.

The west end processing plant is proposed to reduce traffic and dust generation. Tracked equipment will be parked in the area designated for processing current mining phase when not in use. Other equipment will be parked at the existing processing facility and personnel cars will be parked at this location during working hours. The processing facility will be the site where daily fueling, lubing and repairs take place for all equipment. There may be minor occurrences of

breakdowns away from the processing facility that will require equipment to be repaired in the field.

4.3 d. Processing Plant Operations

Processing plant operations would include the stockpiling of aggregate, loading of raw aggregate into conveyor chutes, washing the aggregate, sorting, crushing the aggregate to market specifications, and delivery into stockpiles or into hauling trucks for delivery. In general, the proposed mining operations would normally occur between the hours of 7 am and 5 pm, Monday through Friday, with occasional need to operate longer hours from 6 am to 6 pm, Monday through Saturday, during peak demand periods. The plant operations would be centrally located in reference to the mining pits, thereby reducing the distance traveled by the large aggregate haulers from the pits to the plant.

Loaders would deliver raw mined aggregate to the plant chutes, which would carry aggregate into a jaw crusher. Aggregate would then enter a cone crusher, followed by screening and washing into its final form for delivery to client hauling trucks. An average of approximately twenty (20) twenty five (25) ton loads would leave the processing plant on normal production days Monday through Friday. There would be an estimated fifty (50) load per day maximum during peak demand periods with deliveries from Monday through Saturday.

Hauling trucks would deliver the product to a variety of markets in the region. In general truck will use the following routes:

- Navajo Nation Highway N36 West to U.S. Highway 491;
- Navajo Nation Highway N36 to U.S. Bisti Highway 550.

Every effort will be made to equally divide the traffic trips from deliveries between these two different routes. Based on these assumptions a preliminary analysis of project impacts on traffic and circulation conditions will be available by NNDOT and Bureau of Indian Affairs ("BIA-RD") Roads Department.

4.3 e. Water Usage

An estimated fifteen thousand (15,000) gallons per day would be used for washing the aggregate and for dust suppression in the project site. The water used on the site for these purposes would be pumped from the small pond located on the project site's northwestern side. Water will also be recycled from the wash water-settling pond and used for either dust suppression or wash water. Sediment will be excavated from settling ponds for use as fill and any subsequent reclamation activities. The proposed settling basin will be around 1/2 acre in size and ten (10) feet deep. The basin will collect used wash water from the processing plant and allowed to settle. An adjustable standpipe will collect clarified surface water from the basin for reuse as process wash water or for dust suppression. The mine operators will submit an application for water permit from the NNDWR for commercial use of water.

4.3 f. Drainage Plan

The existing surface water drainage will flow across the project site following the natural slope of the site, which is generally in a southwesterly direction. The sheet flow of water follows natural

drainages on the site into the fields and roadside ditches with some discharge into the river. The proposed project would prevent surface water flows from the mining operations discharging into the river. This would be accomplished through construction of water control dikes and berms, grading during mining operations so that surface flows are directed to the interior of the mining phases, and through the construction of a dikes and berms at the southwestern boundary of the project site. The design of the haul roads would be sloped toward the pit areas to prevent storm water runoff from leaving the site and from floodwaters entering the river. These measures would redirect the existing drainage pattern so that sheet flow discharges into the mining pits and available mining ponds. Therefore all drainage water will be contained within the mining area of the project site.

The overall configuration and grading plan for the site would prevent the discharge of storm water from the site to any waterways. The stockpiles of overburden and aggregate materials will be placed so that runoff can be collected and contained on-site. The one exception to this is the mining area following reclamation. This area will be graded to allow unimpeded drainage of the site following the events of rainfall or flooding. This is to ensure that depressions on the mine site as floodwaters recede.

The project is designed to comply with all federal, State, Tribal, and local laws, such as the Navajo Nation Clean Water Act and Solid Waste Regulations. As such, the Navajo Nation EPA and Navajo Nation Water Resources Department will be consulted during the application process. The Navajo Nation EPA and Solid Waste Management will issue Water Discharge Requirements after review and approval of this mining and reclamation plan.

4.3 g. Pollution Prevention

The only potential source for pollution on the site could be from the fuels and oils used for equipment. The maximum amount fluids stored on-site will be 500 gallons of fuel in an aboveground storage tank and approximately three 55-gallon drums of lubricants and transmission oil.

Storage of fuels and oils would comply with the Navajo Nation EPA guidelines for pollution prevention near water bodies. The vehicles and equipment used in the operation of the project would be maintained to prevent any possible leaks. Routine on-site maintenance will be conducted under an estimated 1,000 square feet maintenance canopy. Major repairs, other than emergency repairs, will be conducted at an off-site facility. Since on-site drainage will be designed to stay on the site and any erosion control measure would be used to control off-site erosion, off-site drainage of potential leaks from operations would not occur.

4.3 h. Disposal of Mine Wastes

The mining operation would crush and produce materials from aggregate that would be classified as non-hazardous by the NNWMP and NNAQCP. All overburden will be used on-site for backfilling the mining pit, the construction of dikes, and formation of the dikes. A small portion of the aggregate material would be used on-site for roads, while the majority would be transported to the plant site to be processed and sold.

Some sampling of the overburden dikes would be sampled to determine the presence of any acidic materials. This will be done periodically by the operators and reported to the Navajo Nation EPA.

4.3 i. Dust and Noise Control

Water trucks and dust suppressants shall be used during the mining operation to control dust created by vehicle movement. The 750-kilowatt diesel generator used to supply power will be housed and enclosed in a vanguard to reduce noise. Any emissions from the diesel generator will be routinely check by Navajo nation EPA and permitted the regulating body. The potential sources of noise on the site will be from the operation of the heavy equipment and processing plant during the mining operation. The earthmoving and processing plant equipment would operate in accordance with the Navajo Nation Noise Ordinance, or by the Navajo Nation EPA.

Although new noise sources would be created by the project that would affect nearby residences, the proposed project would incorporate noise control measures into the project. The mobile machinery and equipment used on the site would be fitted with noise suppression mufflers in accordance with applicable Tribal, State, or Federal regulations. The processing plant would use teflon-coated aggregate chutes to reduce noise levels. Other measures that could be used to comply with the Navajo Nation ordinance could include noise curtains installed around operating equipment and trucks operating within the property using strobe lights rather than warning beepers. Noise mitigation measures would be implemented to the extent necessary to ensure that noise levels would remain within Navajo Nation and Mine Safety & Health Administration ("MSHA") standards.

The project is designed to comply with all Tribal, State and Federal laws pertaining to air quality control standards and regional air quality plans. As such, the Navajo Nation EPA would be consulted during the application process. The Navajo Nation EPA will issue permits for mining and reclamation operations after review and approval of this mining and reclamation plan.

4.3 j. Natural Resources

Protection Fish

All San Juan River fish species described in the Biological Evaluation, as well as other native and non-native fish species, will not become stranded, or entrained, in the mining pits during high river flow periods.

Visual Resources and Project Noise

A "spur dike or overburden dike" would be constructed along the eastern, western, and southern borders of the project site. This dike would serve to provide additional runoff protection for properties to the east of the project site. It would also serve to attenuate project noise and mitigate views onto the project site from adjacent properties.

Terrestrial Biological Resources

Less than one (1) percent of the project site exhibits evidence of numerous abandoned and capped oil wells. Also, the remains of an existing old gravel pit is located in the north-central

portion of the project. The elevation is approximately 5,045 feet (1,537 meters) with soils described as Blackstone-Camac-Rock outcrop complex, which exceeds a depth of 20 inches and are alluvium soils derived from sandstone, quartzite, granite, shale, and siltstone (USDA NRCS 2001).

The soils are not listed as hydric soils by NRCS. The project is derived from the upper part of the Mancos shale formation. The San Juan River is located north of the project area, but is physically separated due to the elevation difference created by the steep banks. There are no wetlands or riparian areas within the project area. The project drains to the southwest.

The project area falls within the Great Basin desert scrub plant community as defined by Dick-Peddie (1993). The dominant plants were four-winged saltbush, Russian thistle, rabbit brush, broom snakeweed, brome, Indian rice grass, alkali sacaton, kochia, prickly bear, many-headed groundsel, and big galleta grass. The Biological Evaluation list protected species with a potential to occur in the project area. This is obtained from Navajo Nation Fish and Wildlife Department ("NNFWD"). In addition, the potential for 20 species of concern to occur within the project area have been evaluated in the Biological Assessment.

There will be no impacts to any "Waters of the U.S." from the proposed project. Therefore, neither a Clean Water Act Section 401, Water Quality Certification, nor Clean Water Act Section 404 permit will be required.

The Project site is nearby the Colorado Pike Minnow and Razor Suckerback Critical Habitat, but constitute elements of the critical habitat are not on the project area, so project will not effect those species.

Construction avoidance measures and the implementation of setbacks will be necessary to protect sensitive or jurisdictional habitats and special-status wildlife species that occur or potentially occur within these areas. All mining operations and associated activities shall maintain a 60 meter buffer from habitats, shrubs, and plants be checked for nesting birds before construction commences if during breeding seasons, March and July.

Prior to any disturbance within the required 100-foot setback from the endangered plants and species, the NNDFW must be consulted, adequate mitigation implemented and necessary permits acquired. The NNDFW will be consulted before any disturbance within the setback area is considered.

4.3 k. Public Safety

The issue of public safety shall be addressed in accordance with Navajo Nation Code of Regulations. Fencing and signage would be installed to limit public access to the site. Future development surrounding the project site will increase public exposure to on-site hazards. Therefore, as future development occurs near the site, additional public safety measures would be installed to prevent entry to the site.

5. RECLAMATION PLAN

5.1 Reclamation Process

5.1 a. Overview of Reclamation Process

The SJSG Project site encompasses approximately forty (40) acres, of which approximately twenty-two (22) acres will be mined for sand and aggregate materials, or used for processing activities. The remaining eighteen (18) acres will be used as a processing area. All activities will be done in compliance with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease, this SJSG Project reclamation plan identifies the means by which the areas disturbed by proposed mining activities will be restored for beneficial use.

For the SJSG Project site, proposed reclamation activities would create wildlife habitat in the form of reclaimed farmlands, and habitat in the form of revegetated pit side slopes, access roads, dikes, and aggregate processing areas.

The revegetation plan contained herein also includes provisions for the enhancement and preservation of areas of existing habitat that would be undisturbed by mining activities.

Reclamation of the project site will be carried out concurrently with proposed mining activities to the extent possible. In areas where mining activities are complete and future disturbance can be avoided, reclamation will commence.

The proposed approach to reclamation and revegetation of the project site is detailed in Section 4.3 (Revegetation and Erosion/Drainage Control Plan) along with performance criteria to assure success of the revegetation effort. In general, revegetation of the project site will be accomplished by preparing disturbed areas by tilling and/or resoiling using topsoil collected onsite during mining operations. These areas will then be transplanted and seeded using locally collected plants and seeds.

Under the proposed reclamation plan, the western boundary of the mining pit would be converted to its original topographic elevation and sloped toward the mining pit. This reclaim land will be used for agriculture or grazing purposes. The reclaimed lands would be converted to agricultural and, or grazing hills restored to divert storm water away from the mining pit. These areas will serve as habitat for wildlife native to the region and agricultural uses. The ability to accomplish this end result will require following basic concepts to be implemented as part of the reclamation plan.

The key to any process that alters the present surface contours requires that stable drainage and surface conditions be established through proper grading of the site. The placement of top soil/overburden on the reclaimed areas for farmland and within the excavated areas would necessitate shaping of the surface through grading activities to develop slopes that become stable with vegetative growth. The revegetation of the site (side slopes, and dikes) would be assisted through the natural seed germination from local plants in areas surrounding

the site or on the site in undisturbed areas and from the revegetation plan. Reclamation activities would occur after each successive mining phase.

Please see Appendix D for the mine reclamation plan developments and cross sections.

5.1 b. Schedule

The volume of the overburden excavated during the proposed mining phases will drive the schedules for the final reclamation. This schedule would initially follow or occur concurrently with the mining of each phase, but would be periodically reviewed as mining progresses. Interim reclamation areas would be established after several years when mining activities would be completed and surfaces, or at the completion of a phase. Monitoring will be conducted on the interim reclaimed areas and final reclamation during the appropriate seasons. Reclamation of the project site, including monitoring activities, would be complete within five (5) years of completion of mining activities.

5.2 Engineering Data

5.2 a. Final Slope of Project Area

Mining and excavation activities will create the base side slopes for the specific areas around the dikes as discussed in Section 3, above. The overburden slopes would be a maximum of 2H: 1V towards the excavation areas near the river and natural runoff drainages. The stability of the slopes would be based on Slope Analysis prepared for the proposed project and from application of general engineering practices to determine slopes at the varying depths of mining excavation.

This analysis of existing soil characteristics and projected groundwater levels determined a general rule for a maximum slope of 5H: 1V for the slope area above the water line and to a depth of five (5) feet below the water line. The maximum slope below five (5) feet from the water line could be 3H: 1V (being the average critical gradient of the native material) depending on the soil conditions and flow of groundwater. These side slope areas will be formed using mostly native material and breaking down steep side slopes for gentler side slopes on the pond perimeters. Slope stability would be monitored throughout the mining phase of the project to ensure that underlying formations and materials would remain stable within the planned mining and reclamation slopes. As determined by the slope analysis, all pit slopes will need to comply with all safety factor standards in compliance with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease.

Rainfall waters would be circulated in ponds and the migration of ground water would be maintained through the neighboring native undisturbed material. These "windows" of undisturbed native materials will act as conduits for the migration of water from and to the navigable waterways through the final reclamation configuration. As has been observed at other mining operations, water continues to pass through areas of overburden backfill, but at a slower rate than through undisturbed native material. Final slopes of the mined areas that

transition to undisturbed or reclaimed areas will be sloped to match the surrounding topography of the site. The final topography of the project site will be upon completion of site reclamation. The final reclaim slope would not be greater than 5(Horizontal): 1(Vertical).

5.2 b. Reclaimed Land Use

The goal of this reclamation plan is to return the area to a stable, self-sufficient ecosystem. This system will be comprised of dikes, open space areas, and an area of approximately twenty-two (212) acres will be excavated and returned to grazing or farmlands.

The temporary dikes to be created along the lease boundaries of the mining plan will be removed upon the completion of mining activities. This dike is designed to provide protection of the excavation from flood events during the first phase of mining. The dikes will be removed upon the completion of first phase of mining and the overburden materials used to create the dike will be used in addition to other overburden generated by excavation of the second phase to backfill the second phase mining pit. Backfilling of the second phase mining pit will be done to an elevation above typical groundwater elevations and that allows the restoration of farming activity.

Maintenance of the dikes will be required of the existing property owner, in perpetuity. Any future transfer of ownership of the property will not be allowed in compliance with the Navajo Nation Sand and Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease, unless written approval of the Navajo Nation and the Bureau of Indians Affairs permits too.

Natural recruitment of plant growth and proposed revegetation along side slopes of the dikes will provide additional areas for cover, forbes, and nest sites for wildlife. The side slopes and bottoms of the mine will have a varying contour across each reach to assist in the growth of plant and biological species.

The final configuration of pit side slopes, bottoms and dikes would vary based on the nature of the aggregate mined and the depth of the material. Revegetation would place native grasses, bushes, and native trees on side slope areas that range from 2*H: 1V to 1*H: 1V.

All seed mix and seed density, nontoxic species, are listed in the table below and subject to change, if necessary with the Navajo Nation Department of Agricultural ("NDA").

Table 4	
Recommended Seed Mix	
Species	Percentage
Alkali Sacaton	1.94
Blue Grama	3.87
Sideoats Grama	19.35
Indian Ricegrass	25.81

Gallenta Grass	19.35
Sandberg Bluegrass	3.87

Upon completion of mining activities, all machinery, waste, scrap and excess materials would be dismantled and removed from the site. All materials would be recycled or taken to the nearest appropriate landfill. After removal of the facility, the ground beneath the former processing facilities and access roadways that are no longer in use will be deep tilled to eliminate soil compaction from the facilities and road use. The area will be resoiled with stockpiled overburden remaining from the first phase of mining with a minimum depth of (six) 6 inches or as needed to ensure establishment of the proposed revegetation of the site. The ground would be graded to match final reclamation topography and then revegetated. The reclaimed land shall be irrigated through the use of the on-site groundwater well and existing water flow in an existing open ditches or canals. This source of water would be applied to the reclaimed farmland for the production of alfalfa, melons, and corn, as are presently grown on the project site. During the topsoil/overburden removal process, the depth of any distinct layers would be recorded to determine the appropriate layer thickness during the reclamation process of the farmland areas. Topsoil depth would be established through the review of existing soil profile changes and observed root zone depths of existing crops.

5.2 c. Erosion and Drainage Control

Erosion would be controlled during each mining and reclamation phase. Overburden piles and soils in the mining areas would be exposed to wind and storm conditions that would require treatment with a hydroseed/mulch preparation to restore the structure of the bare soil on an as needed basis. A seed mixture would be selected so that germination occurs rapidly in the disturbed native material or stockpiled overburden. This type of application would reduce the movement of soil due to erosion from heavy rainfall.

Drainage control will occur through grading of areas surrounding the active mining area of each phase to contain drainage to that phase. Sloping of the area surrounding the open pit will direct drainage to the open mined area. This will minimize the potential for runoff of sediments to other areas of the project site. Stockpile areas will also have external swales to direct drainage flows to open mining areas or pits. Erosion control measures would be designed for not less than a 1 hour/20-year intensity storm event.

The final grading of the project site is will start from the eastern second phase boundary and sloping to the reclaimed slopes of the first phase and third phase. Within second and third phases will be agricultural and grazing hills to match landscape. This final grading of the project site will create slopes and contours that maintain the drainage to the pits from areas previously disturbed by mining and reclamation activities. Final grading will simulate pre-project conditions in the western portion of the project site.

This approach strives to eliminate the possibility of significant sediment runoff entering a down-gradient water body (i.e., the San Juan River). The mining operation's Storm Water

Pollution Prevention Plan ("SWPPP") would be developed to meet those requirements and approved by the Navajo Nation EPA. The distribution of any fertilizers or soil amendments used for the enhancement for revegetation would be placed to avoid contact with river water. The applicant will conduct inspections quarterly, to ensure that the erosion control plan is being implemented and that the above measures are properly controlling erosion and sedimentation in all disturbed areas.

5.2 d. Economic Impacts

The regional supply of gravel is limited in the project area, and this operation will satisfy a real need in the local construction industry. The mining operation is located nearby a rapidly growing population area. Of the cities and towns located within the market area of San Juan County, Farmington is experiencing high current and projected population growth.

The growth is proportional to economic development in the area with new opportunities in employment and sales of sand and gravel products.

The people moving to San Juan County come mostly from other areas in the United States and from more densely populated areas of New Mexico. The Four Corners Region of the State of New Mexico remains an Energy & Farming Hub for Oil & Gas, Coal, and Farming. A majority of the people looking for employment and moving to the region is looking for a more affordable housing market and long-term employment.

With the large increases in population expected, there also exists a need for more housing units. New roads must be built, existing roads expanded, gutters and sidewalks installed, and house foundations built to accommodate this demand.

5.3 Revegetation & Erosion / Drainage Control Plan

5.3.a Revegetation Overview

The SJSJG Project site is located along the southern banks of the San Juan River approximately 20 miles west of Farmington, New Mexico and 15 miles east of Shiprock, New Mexico. The entrance into the project site will utilize the Navajo Nation Highway N36. Specifically, the site occurs within New Mexico 7.5 minute USGS Quadrangle and occupies upon the Navajo Indian Reservation, and surrounded on both side by Township 29 North, Range 17 and 16 West.

The entire project area encompasses approximately forty (40) acres, of which approximately 21 acres will be mined for sand and aggregate materials, or used for processing activities. The remaining 19 acres will be used as a processing area. The forty (40) acres to be used has a gentle slope at 1% to the south, and the physical area can generally characterized as being relatively narrow valley bordered by a series of terraces which extend to the upland plateaus in an ancient floodplain with relatively flat agricultural fields. Elevation within the project site range between 5,025 and 5,045 feet above mean sea level. The San Juan River is located along the northern boundary of the project area with the Fruitland Irrigation Channel running along a portion of the southern boundary of the project site.

Current land use within the site consists of agriculture and livestock grazing. Implementation of the revegetation would serve to control erosion from disturbed areas of the project site, establish a diversity of habitat types in areas to be disturbed by mining and processing operations that are compatible with surrounding habitat types, preserve and enhance existing onsite Great Basin Desert scrub plant communities, and provide the long-term protection of San Juan River fisheries from impact during project site flooding.

5.3.b. Plant Communities

The project area falls within the Great Basin desert scrub plant community as defined by Dick-Peddie (1993). The dominant plants were four-winged saltbush, Russian thistle, rabbit brush, broom snakeweed, brome, Indian rice grass, alkali sacaton, kochia, prickly bear, many-headed groundsel, and big galleta grass. The Biological Evaluation list protected species with a potential to occur in the project area. This is obtained from NNDFW. In addition, the potential for 20 species of concern to occur within the project area needed to be evaluated.

5.3.c Special Status Plant and Wildlife Species

A Biological Survey has been performed for the entire project site by Stephanie Lee (EMI Biologist) under the supervision of Bill Hevron. Database searches and reviews of various state and federal special-status species lists in support of these activities revealed 4 special-status plant species and 20 special-status wildlife species with the highest likelihood to occur within the project area. The NNDFW reported the southwestern willow flycatcher, Mancos milk-vetch, and Mesa Verde cactus are known to occur within three miles of the proposed project site. In addition the black-footed ferret, banner-tailed kangaroo rat, kit fox, bald eagle, golden eagle, ferruginous hawk, peregrine falcon, western burrowing owl, mountain plover, yellow-billed cuckoo, belted kingfisher, yellow warbler, northern leopard frog, bluehead sucker, molten sculpin, roundtail chub, Colorado pike minnow, and the razorback sucker.


5.3.d Regulatory Requirements

Reclamation standards are under the compliance with the Navajo Nation Sand & Gravel Lease, specific requirements of the Navajo Nation reviewing departments and all applicable federal regulation will govern the mining and reclamation operator of the sand and gravel lease. All reclamation activities will be performed in accordance with applicable laws, codes, and regulations required by authorities having jurisdiction over such work.

5.4 Revegetation Plan and Design

5.4.a Objectives

The final end use for the SJSJG Project mining site is an open space, including habitat for terrestrial wildlife and agriculture. This revegetation plan is specifically designed to provide



for the creation of high quality wildlife habitat that is representative of the character of the surrounding areas and of the property. In doing this, revegetation will provide for the enhancement of the aesthetic value of the area.

5.4.b Baseline Studies

5.4.b.1 Plants and Wildlife

Focused plant and animal surveys and inventories shall be conducted on the entire project site prior to the implementation of mining activities to assess existing vegetative conditions, establish a baseline for monitoring, and determine the presence or absence of special-status species. As described in section 4.3.c above, database searches and reviews of various state and federal special-status species lists in support of these activities revealed 4 special-status plant species and 20 special-status wildlife species with the highest likelihood to occur within the project area. Focused surveys for all potentially occurring species shall be conducted by a qualified botanist(s) and wildlife biologist(s) experienced in undertaking biological surveys including the rare, threatened, and endangered species. A complete list of plant and wildlife species observed during these surveys shall be compiled and utilized to determine planting palettes, seed sources for revegetation, and wildlife enhancement opportunities. The results of biological surveys shall also be used to compare environmental conditions before and after habitat creation to provide a measure of change in wildlife habitat and species composition occurring within the reclamation areas, as well as aid in the determination of mitigation success.

5.4.b.2 Implementation Plan

The habitat communities and their respective revegetation design are described below. Revegetation areas will consist of one plant community. This community is the Great Basin desert scrub plants. This habitat community occurs along a relatively dry environmental gradient. This habitat-type is naturally occurring within the project area and will be the source of plant material, to the extent feasible, for revegetation efforts.

This revegetation plan is designed to improve the wildlife habitat quality of the site and the aesthetic value of the area post-mining. Habitat communities selected and their respective revegetation designs are based upon the biological characteristics of the project site and surrounding areas, site topography, and the commodity being mined (aggregate). Plant species diversity within each designed habitat community was selected to compliment the existing/preserved habitats on-site and while providing greater opportunities for utilization by wildlife. It is anticipated that the final elevations relative to groundwater levels will be the primary factor determining which habitat communities are most appropriate for a given area. Where appropriate, a diverse mix of plant species that vary in their moisture requirements will be seeded in areas likely to experience fluctuating changes in hydrology. Plant species selection, methods of establishment, planting locations, and planting densities are described below.

Table 5		
Plant Species Occurring within Project Site		
COMMON NAME	SCIENTIFIC NAME	STATUS*
Plants		
Mancos milk-vetch	<i>Astragalus humillimus</i>	NESL G2; ESA E
Mesa Verde cactus	<i>Sclerocactus mesae-verde</i>	NESL G2; ESA T
Naturita milk-vetch	<i>Astragalus naturitensis</i>	NESL G4
San Juan milkweed	<i>Asclepias sanjuanensis</i>	NESL G4

*EPA = Eagle Protection Act; ESA = Endangered Species Act; G3 = Group 3; MBTA = Migratory Bird Treaty Act; NESL = Navajo Endangered Species Act; T = Threatened

5.4.b.3 Great Basin Desert Scrub Plants

Vegetation in this community is dominated by relatively desert tolerant species such as the four-winged saltbush, rabbit brush, broom snakeweed, broom, Indian rice grass, alkali sacaton, Kochia, scattered prickly pear, mand-headed groundsel, and big galleta grass. The development of this habitat will be accomplished by creating gentle slopes at elevations from five (5) to twenty (20) feet above average groundwater levels. This depth is in compliance with the NNDFW.

5.4 Habitat Enhancement

Structures that enhance or facilitate interim habitat use shall be created for birds and other terrestrial and aquatic species if needed. Structures that provide shade, shelter and food, including nesting boxes, platforms, rock piles, birdhouses, brush/log piles, and similar structure, are known to attract diverse wildlife.

In addition to the above-mentioned structures, establishment of host plant species within the reclamation site may facilitate colonization of habitat specialists.

5.5 Topsoil Replacement and Installation Procedures

Upon completion of the grading operations for the excavation and embankment slopes and other areas, topsoil that has been stockpiled shall be replaced to a uniform depth of not less than 15 cm (6 inches) and compacted or stabilized in a manner that retains the material in place on slopes, but will not inhibit or prevent plants from becoming established. Topsoil shall be moved and/or worked when the soil is dry to help prevent compaction, smearing, and disturbance to slopes when they are wet or muddy. In addition, plant and soil microbial propagules are in a resistant state when the soil is dry and are better able to survive the moving and contouring processes.

Prior to planting any reclamation area, an analysis of the physical and chemical composition of the planting soils shall be undertaken. Because topsoil's to be planted will be stockpiled for some period of time, and stockpiling is known to alter the chemical, physical, and biological components of soil, soil testing shall be completed before planting activities commence. Soil characteristics have direct and important effects on the successful establishment of plant communities, and thus, the sustainability, invasibility (by exotic species), resiliency, and productivity of the reclaimed habitat. Soil collected from 0 to 120 cm shall be tested for texture, bulk density, organic matter content, and plant nutrient availability (e.g. nitrogen, phosphorus, and potassium). Results of these tests shall help determine potential limiting factors for plant growth and establishment, and the necessity to include soil amendments as part of the revegetation process.

The use of erosion control measures will be necessary to help keep soils in place during the early phase of plant establishment. Erosion control methods shall include, but are not limited to the use of straw mulches and/or the use of biotechnical controls such as straw and willow wattles. Straw mulch will be sprayed onto slopes in upland areas and either glued down with a tackifier or punched into the substrate. Wattles will be installed along contour on slopes after seeding and straw mulch application, but prior to containerized plant installation. Wattles will be installed along contour every twenty (20) feet, thus reducing slope length. Willow wattles in particular shall be used to stabilize those soils in the wetland zone subject to inundation.

5.6 Irrigation

During the first and usually second years after planting, woodland and some of the riparian wetland plants may require supplemental water to help reduce mortality. The irrigation system will be drip system installed to utilize the on-site groundwater resource. Water will be applied deeply, to one to two feet, in the outer two-thirds of the root zone. The watering regime will be monitored regularly and will be adjusted as deemed necessary to assure acceptable seedling survival rates. Irrigation will not be used during the rainy winter months. The goal of irrigation is to add enough water to aid in plant establishment without making the plants dependent upon the additional water in the long-term. The frequency of irrigation will be reduced gradually to ensure successful weaning of the plants from artificial watering. Vegetation will be self-sustaining without irrigation for a period of two years prior to the release of the financial assurances.

5.7 Plant Procurement and Installation Procedures

A variety of different plant materials and planting methods may be used in restoration of this habitat-type. The most common plant materials used are seeds, container-grown plants, and cutting. The specific planting method will depend upon the materials that are available. When determining the type of plant material and planting methods, consideration is given to species characteristics, site conditions, and project goals.

All planting efforts will occur between November and May to take advantage of seasonal moisture. For this to occur, scheduling of revegetation efforts will include time for the collection of seeds and grow-out of those species in the nursery. This will require at least one-year lead-time. Seeds grown in the nursery may also require a hardening-off period if the nursery environment differs from the site.

The following are various technical specifications regarding plant materials and their installation. Contingent upon the results of the Test Plot Study, amendments to soil prior to or during the time of planting may be required. The addition of organic matter, such as compost, may greatly benefit the restoration site.

5.7.a Natural Colonization

Natural colonization is the process where existing conditions are suitable to support plant establishment and growth without human intervention. Although this process is often difficult and very slow under disturbed conditions, some natural colonization of desired vegetation is expected to occur in areas of the project site. Seed sources provided by adjacent undisturbed areas could produce volunteers of a variety of desert species, given the appropriate hydrological conditions in the reclamation areas. The natural revegetation of target species would be encouraged and allowed to occur.

5.7.b Planting Seeds (Native grasses and wildflowers)

Naturalized annual grasses and exotic species are likely to colonize much of the area post-mining, especially due to their dominance on the project site. However, several

native grass and wildflower species will be planted to increase native plant diversity. All seeding shall be carried out in April-May, after the first wetting rain has moistened the ground and as the cool season seed will grow utilizing winter moisture at the higher elevations. The seeded site will be covered with hay or straw mulch at the rate of 1.5 to 2.0 tons per acre.

Seed will be ordered from a reputable supplier that collected seed from, or grew-out seed from, a source as close to the project site as possible. Seed will be properly labeled as genus, species, subspecies, variety, and source and will be handled and packed in a manner that ensures the purity and viability of the materials. Weed seed will not exceed 0.5 percent of the pure live seed and inert material. Seeding rates will be given in pounds of pure live seed (PLS) per acre. The seed mix will be measured and packaged by the seed supplier. Seed will be delivered to the site tagged and labeled in accordance with Navajo Nation Code. Clearance from NNDA will be obtained before planting seed delivered from outside the habitat areas in which they are to be planted.

Prior to seeding, planting areas shall be lightly disked or harrowed, if necessary, to loosen the soil. Proper seed-soil contact is a necessity. Seeds will then be hydro seeded onto the soil or broadcast using a belly grinder, depending on the size and constraints of the area. Seeding rates reported herein are appropriate for hydro seeding. Hydro seeding uses less seed than broadcasting. If broadcast seeding is more appropriate for an area, seeding rates will be adjusted. After seeding, areas shall be covered with straw mulch blown or broadcast over the area and applied with a tackifier. Straw much shall be applied at a rate of 1.5 to 2.0 tons/acre within 24 hours after seeding.

5.7.c Plugs

Plugs of desert species shall be installed upright into previously dug pits in the substrate. Plugs and the accompanying soil shall be incorporated firmly into the pits and there shall be no air spaces in the soil surrounding individual plants or plugs.

5.7.d Installation of Containerized Plants/Seedlings

Propagated stock grown from seed collected on-site, or from adjacent or nearby areas shall be used for desert creation. No more than 30 percent of any individual plant or cluster of individuals will be harvested for propagation. Should seed be limited for desirable species, container stock of those species shall be purchased from a local native plant nursery. Clearance from the Navajo Nation Department of Agriculture shall be obtained before installing plants delivered from outside the county in which they are to be planted.

Desert species to be planted will be healthy, vigorous, well formed, and free from disease, windburn and environmental stress. Planting locations will be staked in the field prior to plant installation. Plants will be randomly staggered within their respective planting zones to avoid straight rows and to create naturally appearing plant associations. Adjustments to the planting design will be made as determined necessary to meet field conditions.

Plants will be installed in November thru April, after the first wetting rain has moistened the ground. Plants will be placed into holes dug to a size twice the width and three times the depth of their container. If weedy species are present within the planting area, a circle at least 3 feet in diameter around each planting location will be cleared of all vegetation prior to plant installation. Compacted soil at the bottom and sides of the hole will be loosened. A slow release, balanced fertilizer will be added to each planting hole. The hole will be partially filled with water and excavated soil and allowed to completely drain. Plants will be removed from the container and the sides of the root ball lightly scarified (to promote root development). Plants will be placed in the planting holes so that the crown of the plant is at ground level. Excavated soil will be used to fill the bottom of each hole to achieve the proper planting level and to backfill the remaining space around the root ball. A watering basin will be made around each plant. Immediately after installation, plants will be sufficiently watered to reach the lower roots. Mulch will be placed within the watering basins of all planting holes to a depth of 2-4 inches thick. Wire cages or tree shelters will be used to protect young plants against herb ivory. If deemed necessary (particularly for larger container plant), plants will be staked to prevent damaging movements.

5.8 Maintenance during the Monitoring Period

Maintenance of the reclaimed sites during the early stages of plant establishment is essential to the attainment of reclamation objectives and performance criteria. The revegetation areas will be maintained in good condition through regular monitoring to detect problems before they affect the attainment of performance criteria. Maintenance measures include invasive species control, erosion control, irrigation system maintenance, herb ivory control, trash removal, and habitat protection. Each of these issues is addressed separately in the maintenance plan included below.

5.8.a Invasive Species

Areas planted with native species will be weeded between the months of April and August using the best available method. Herbicide treatment for invasive species that cannot be eradicated through manual or mechanical removal (e.g. exotic thistles, and grass, etc.) will be permitted as needed. The method of herbicide application will control for the overuse of such chemicals, including wicking of individual plants or the mixing of brightly colored dyes with herbicide so that application is visible. Invasive species will be removed before they produce seed. All flowering stalks of invasive species will be removed from the reclamation site.

5.8.b Erosion Control

During the first two (2) years of plant establishment, vegetative cover may not be adequate to prevent soil erosion. If erosion occurs, areas will be identified and measures to prevent further erosion implemented as soon as possible. Erosion control measures may include the addition of silt fences, mulches, wattles, bales or replanting, depending on the site conditions.

5.8.c Irrigation System Maintenance

Inspection and maintenance of the irrigation system in the Great Basin desert scrub plant community will be checked twice a year.

5.8.d Herbivory Control

To reduce herbivore damage to young plants, wire cylinder cages will be installed around individual plantings as necessary. Cages should be large enough to allow two years of new growth before they can be browsed. Should ground dwelling rodents also cause damage to plants, tree shelters will be installed two to four inches into the ground. Consideration will also be given to the installation of tree shelters in weed-infested areas requiring chemical herbicide applications, as tree shelters may protect plants from herbicide drift. Plants will be monitored for herbivory during routine maintenance visits. Cages and tree shelters will not interfere with plant growth.

5.8.e Supplemental Planting

Annual maintenance activities will include supplemental planting of Great Basin desert scrub plant species to attain the standards described in the performance criteria, and/or to replace those individuals lost as a result of some severe disturbance.

5.8.f Trash removal

The reclamation site shall be cleared of trash as determined necessary and measures shall be taken to prevent further dumping.

5.8.g Habitat Protection

Fences will be constructed around the reclamation site to protect the sensitive areas from human activity. Signage describing the site as a sensitive resource will also be posted in appropriate areas. Inspection and maintenance of fences, gates, and signage will be conducted twice annually.

5.9 Restoration Monitoring Program

5.9.a Monitoring Period

Monitoring by a qualified biologist will be conducted following completion of habitat creation until performance criteria have been met for two consecutive years having no human intervention. Corrective or remedial actions will be undertaken if success criteria are not attained in a given monitoring year.

5.9.b Reference Sites

Success of the revegetation plan shall be judged based upon the effectiveness of the vegetation for improving wildlife habitat and the ecological and aesthetic value of the area, and by comparing quantified measures of vegetation cover, density, and species richness of revegetated areas to similar parameters of naturally occurring vegetation within the larger project area. Data from reference areas shall be used as a standard for comparison. Reference areas shall be established in the habitat-type: Great Basin Desert Scrub.

5.9.c Vegetation Monitoring

Vegetation monitoring protocols have been developed for the habitat type created. Vegetation surveys will be conducted once annually when dominant vegetation has matured and both early and late season species can be correctly identified. Surveys shall be conducted by a botanist(s) experienced in undertaking floristic field surveys and knowledgeable of plant taxonomy and ecology. The results of vegetation surveys will be used to compare site conditions over the maintenance and monitoring period. Acreages for the habitat type will be updated annually through field measurements. A list of all species present will also be collected for the habitat community.

5.9.c.1 Great Basin Desert Scrub Plant

Habitat shall be evaluated using quadrates' (1-m²) to determine species diversity and cover. A stratified random sampling design shall be employed. Data collection points shall be mapped using GPS.

Standard data log sheets for all habitat type shall be established and used throughout the monitoring period. The data sheets shall include a section to record ambient site conditions at the time of monitoring (date, time, weather, and special condition) and standard data to be collected for each parameter to be monitored.

5.9.d Wildlife Monitoring

Observations of wildlife or their signs (e.g. tracks or scat) will be recorded whenever encountered, during maintenance monitoring and vegetation surveys. A list of all wildlife species observed will be compiled and summarized in order to compare site conditions over the maintenance and monitoring period. A biologist(s) knowledgeable of wildlife taxonomy and community ecology will conduct wildlife observations.

5.9.e Photo Monitoring

A photographic record of the site will be kept from the time of habitat creation through the end of the monitoring program. Selection of permanent photo stations will provide appropriate views and orientations for a comprehensive assessment of the progress of revegetation efforts over the monitoring period. Photos will be taken in late-spring or early summer at the height of the growing season. Additional photographs of natural recruitment, disturbance, or special conditions will be taken as needed. Photos will be included in the annual monitoring report.

5.9.f Monitoring Report

Every August 1st of each monitoring year, a report will be prepared containing the results of the monitoring and an assessment of the data. Included will be a summary of those performance criteria attained and those for which corrective measures were undertaken to achieve compliance. Photographic and other evidence (i.e. maps, laboratory reports, etc.) will be used to support the final assessment. All data and reports will be sent to the appropriate Navajo Nation Programs.

5.9.g Performance Criteria

Performance criteria have been developed for the habitat community created. Should the evaluation of performance criteria reveal that revegetated areas are significantly behind in their target percentages, the reasons for insufficient plant germination and/or growth will be determined and appropriate remedial actions shall be undertaken to meet the established criteria. These could include planting additional material of the species, or substitutions of other species better suited to the sites failing to attain desired performance criteria. Remedial actions will be applied to all areas requiring them, not merely to the monitored plots.

Wildlife

Created habitat will be characterized by the use of native animals associated with these ecosystems. The habitat will also be characterized by the presence of pollinator and dispersal mechanisms, predator-prey associations, and/or other biological interactions. The presence of such interactions will be determined through vegetation and wildlife surveys.

5.10 Experimental Test Plots

The purpose of experimental test plots is to investigate on a small scale those revegetation practices that will work best when the reclamation plan is fully implemented. The SJSG Project pilot study will be designed to demonstrate the feasibility of Great Basin Desert Scrub plant community establishment through the examination of revegetation methods and management practices on a small, representative site prior to full-scale implementation. Consequently, test plot successes and failures will help determine the most appropriate methods to ensure that reclamation objectives are met. These methods will be used to enhance the habitat quality of the remaining portions of the property upon completion of mining activities.

Implementation of the SJSG Project pilot study will be undertaken upon completion of first phase extraction, or when appropriate areas become available (i.e. when mining operations have concluded one area and is ready for reclamation). Areas for testing revegetation methods will represent each vegetation type and aspect/elevation that would

be represented where reclamation is to take place. This may require stratifying the site in order to determine the most appropriate test plot areas.

5.10.a Test Plot Placement

As a pilot reclamation test project, SJSG Project shall designate separate areas for testing that represent each of substrate types, vegetation types and aspect/elevation types that would be represented where reclamation is to take place. Test plots shall be placed within areas that are homogenous. This will require stratifying the site in order to determine the appropriate test plot areas.

5.10.b Treatments

Various treatments will be established to test the effectiveness of planting techniques, topsoil depths, irrigation, and soil amendments. Planting techniques to be tested may include cuttings, containerized plants, plugs and seed. Topsoil depths to be tested will depend upon the actual amount of topsoil salvaged. Should a growth media need to be created for revegetation, various components of that growth media will also be tested.

For example, combinations of topsoil, sediments, chipped or shredded vegetation (organic matter), and soil amendments. Irrigation rates may vary to determine the most effective application of water. Soil amendments to be tested may include compost, fertilizer and lime, depending on the results of soil testing. Control plots are an important part of the experimental design in the test areas. Some plots in the test areas will have no treatments in order to determine what would happen on the site if there were no active restoration or intervention.

5.10.c Plot Layout

Test plots will be established within the area on a grid system, using a randomized block design. Treatments will be randomly assigned to a plot, and each treatment will be replicated three times. Plants will be randomly assigned their positions within the plots and their locations mapped for monitoring purposes. A buffer will be established around each plot so that treatments in different plots do not contaminate adjacent plots. Monitoring personnel to reduce trampling and compaction within the plots will use buffers. A qualified biologist or reclamation specialist will undertake the final experimental design and subsequent monitoring of the test plots.

5.10.d Plant Species, Procurement and Installation

Plant species to be used in the testing areas will represent those to be used in the large-scale revegetation plan. Plant materials may include cuttings, container-grown plants, plugs and/or seed. Plant procurement and installation shall be conducted as previously described in Plant Procurement and Installation Procedures. If at any time during the pilot study it becomes evident that changes or adjustments to planting methods are needed to assure successful plant establishment, these changes will be implemented immediately and for subsequent revegetation efforts.

5.10.e Test Plot Study Monitoring Program

Monitoring of test plots will provide the opportunity for adjustments or refinement of the proposed revegetation program prior to large-scale implementation. Monitoring by a qualified biologist shall be conducted annually each spring for a period no less than five (5) years prior to any scheduled large-scale application. Every October 1st of each year, a monitoring report will be prepared and submitted to the NNDA for review. The monitoring report will contain the results of monitoring, an assessment of the data collected, any corrective measures that were undertaken, photographs and log sheets. The methods used in the data collection are described below.

5.10.f Vegetation and Wildlife Monitoring

Vegetation monitoring will be conducted separately for each habitat type. Individual plantings will be direct counted and inspected for growth, health, weed competition, water stress, herb ivory, and other factors. The condition or health of each plant will be ranked on a scale of 0 to 4 where 0=dead, 1 =severe decline/nearly dead, 2=stressed/moderate defects, 3=stable/fair health, and 4=healthy/good growth. Height will also be categorized into 5 rankings: < 2 feet, 2-4 feet, 4-6 feet, 6-8 feet, 8-10 feet, and >10 feet. Consideration will be given to the seasonal characteristics and individual growth patterns of different species when determining the condition or health of each plant.

Seeding of agricultural areas and natural recruitment in desert zones will also be assessed qualitatively. Species composition and cover estimates for each test plot will be recorded. A list of all species present will be updated annually of the habitat type in the pilot study.

Observations of wildlife and their signs will be recorded when encountered. A list of all wildlife species present will also be updated annually of the habitat type in the pilot study.

5.10.g Photo Monitoring

Photographs will be taken from various locations throughout the site preparation, revegetation and monitoring phases. Permanent photo stations will be established to document changes in habitat development over successive monitoring periods. Photographs of individual plants and habitat communities will also be included.

5.10.h Performance Criteria

It is anticipated that yearly remedial actions will be taken as certain treatments are determined to be more or less successful than others. Remedial actions may include planting additional material of a species, substitutions of other species better suited to site conditions, and/or additional applications of successful treatments. The pilot study program will be considered overall successes if after five (5) years the following conditions have been met:

- minimum of 50 percent survival of all container plants and cuttings;
- attain at least 60 percent cover of grassland species;
- no greater than 10 percent cover of invasive species (in any given year); and
- plants are in good health and have produced new growth (in any given year).

5.10.i Areas Excluded from Revegetation

The network of access roads required to provide access needed to carry out the initial revegetation work as well as future maintenance and monitoring are not proposed for revegetation.

5.10.j Natural Regeneration

Some natural regeneration will inevitably occur within portions of the project area. Seed sources provided by nearby vegetation will produce volunteers of a variety of indigenous species. This natural revegetation of desired species will be encouraged and allowed to occur. If undesirable species not native to this area begin to invade (i.e., giant reed), such that they become a threat to the establishment of desirable native species, eradication of these species either by hand, mechanical means, control burning, use of herbicides, or a combination thereof, shall be done. The qualified individual that prepares the annual monitoring report shall make this determination.

5.11 Compliance with Health and Safety Laws and Regulations

The SJSG Project Operators will comply with the Federal Mine Health and Safety Act of 1977 (“MSHA”) and all applicable regulations, and the Navajo Nation Mine Safety Code.

No Person will be allowed to work unless that person has completed the mandatory training under CFR, Part 46. It is the operator’s responsibility to file training plans with MSHA. The Navajo Nation Minerals Department will be listed as a “provider” in the training plan if the company wants the Minerals Department to provide the training pursuant to the company’s training plan.

An Emergency Response Plan shall be developed and implemented. The plan must include response to inundate and other flood conditions that might arise due to adverse weather conditions.

5.12 Financial Assurance

The financial assurance estimate and the estimated reclamation costs are in progress. The figures in this report will be based on the disturbance of four to five acres per year, annual movement of 725,000 ± 5% cubic yards of material, replacement of stockpiled overburden for farmland, sloping and grading of excavated areas. The project area does not have any permanent equipment or facilities for removal during the life of the project,

therefore that section has no figures shown for reclamation costs. These figures will be updated throughout the project at a schedule set by San Juan Sand and Gravel, LLC. The information will be supplied to the Navajo Nation Minerals Department for they're on going compliance monitoring of the project.

A performance and reclamation bond limit will be set by the Navajo Nation Minerals Department after the mining and reclamation plan is deemed complete.

San Juan Sand and Gravel, LLC, hereby states that they accept the responsibility for reclaiming the land in accordance with this reclamation plan.



Appendix A San Juan Chapter Resolution

SAN JUAN SAND & GRAVEL PROJECT



SAN JUAN CHAPTER

SANJ-2016 -16

Lorenzo Bates
Council Delegate

Rickie Nez
President

Robert C. Begay
Vice President

Esther Keeswood-Begay
Secretary/Treasurer

Grace J. Chavez
Farm Board Member

Ramie Nelson
Grazing Member

RESOLUTION OF SAN JUAN CHAPTER

RE-AFFIRMING THEIR SUPPORT FOR THE SAN JUAN SAND & GRAVEL PROJECT AND RELATED EFFORTS TO CONTINUE THE MINING AND DEVELOPMENT OF A SAND & GRAVEL BUSINESS IN THE SAN JUAN CHAPTER COMMUNITY

WHEREAS:

1. San Juan Chapter is a duly certified Chapter under the Navajo Nation Government pursuant to Resolution No. CD-86-82 and pursuant to 26 NNC §103 and they are delegated and authorized to review all matters affecting its community people; and
2. San Juan Chapter passed a Resolution No. SANJ-05-012 on November 14, 2004 for Navajo Nation Minerals Limited and for Robert Billy Whitehorse to explore for sand and gravel in San Juan Chapter Community; and
3. San Juan Chapter was approached again by Robert Billy Whitehorse to amend his previous resolution of Navajo Nation Minerals Limited Partnership. He requested to change the name from Navajo Nation Minerals Limited Partnership to Dibe Niitsa, LLC. This amendment was passed on October 5, 2006 pursuant to Resolution No. SANJ-07-001; and
4. San Juan Chapter reinstated and passed a Resolution No. SANJ-2008-104 on October 11, 2007 for Dibe Niitsa, LLC to continue the Sand & Gravel Project in San Juan Chapter Community; and
5. San Juan Chapter passed a Resolution No. SANJ-2008-105 ON October 11, 2007 for supporting and recommending Dibe Niitsa, LLC to be allowed additional five (5) acres of land west of the 100 acres to drill for water; and
6. San Juan Chapter rescinded two Resolutions No. SANJ-2008-104 and SANJ-2008-105 on October 11, 2007; and
7. San Juan Chapter passed Resolution No. SANJ-2012-044 on February 5, 2012 accepting the name change to San Juan Sand & Gravel Project and affirming its support for the project; and
8. That Mr. Robert Billy Whitehorse, Sam Woods and Steven Gunderson all enrolled members of the Navajo Tribe have returned to San Juan Chapter and provided several updated reports of the planning and development of the San Juan Sand & Gravel Project; and

9. San Juan Chapter will act as a stakeholder in the Sand & Gravel Project and promote the study, exploration, assessment, development and mining of the San Juan Sand & Gravel Project in San Juan Chapter community; and

10. The Sand & Gravel materials sought will be used for all construction activities in the development and growth of the Navajo Nation and United States of America; and

11. The Sand & Gravel Project participants is requesting a total of forty (40) acres for sand and gravel materials to study, explore, assess, development and mined & reclaimed.

THEREFORE BE IT RESOLVED THAT:

1. San Juan Chapter and its community people hereby affirms their support for the "San Juan Sand & Gravel Project" (formerly Dibe Niitsa, LLC) and their efforts to study, explore, assess, develop, mine and reclaim a Sand & Gravel Business in the San Juan Chapter community.

2. San Juan Chapter and its community people further affirms their support for the San Juan Sand & Gravel Project Participants to withdraw forty (40) acres for this development that sites within Section 12, T29N, R17W & Section 07, T29N, and R16W.

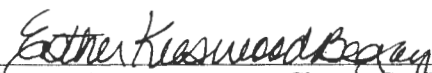
CERTIFICATION

We hereby certify that the foregoing resolution was duly considered by San Juan Chapter at a duly called meeting at San Juan Chapter, (New Mexico) Navajo Nation, at which a quorum was present and that same was passed by a vote of 38 in favor, 0 opposed and 1 abstained on this 13th day of December, 2015.

Motion by: Yolanda Benally
Second by: Alyce B. Joe


Rickie Nez, Chapter President


Robert C. Begay, Vice Chapter President


Esther Keeswood-Begay, Chapter Sec/Treas

Lorenzo Bates, Council Delegate



Appendix B Land Designation Withdrawal Approval

SAN JUAN SAND & GRAVEL PROJECT



THE NAVAJO NATION

RUSSELL BEGAYE PRESIDENT
JONATHAN NEZ VICE PRESIDENT

OCT 21 2016

San Juan Sand & Gravel, LLC
ATTN: Steven Gunderson
6991 E. Camelback Road, Suite B-308
Scottsdale, AZ 85251

Re: Land Withdrawal Designation for San Juan Sand & Gravel, LLC

Dear Mr. Gunderson:

Enclosed for your information and use is an approved Land Withdrawal Designation for San Juan Sand & Gravel, LLC. The Designation approval is for 40 acres for the San Juan Sand & Gravel Tract in E 2 of Section 12, Township 29 North, Range 17 West and the West 2 of Section 07, Township 29 North, Range 16 West, NMPM, San Juan County, New Mexico for a five (5) year term, ending August 2021.

On June 16, 2015, the Resources and Development Committee of the Navajo Nation Council (RDCJN-33-15) delegated the Director of Navajo Land Department (NLD), Division of Natural Resources (DNR), the power and authority to give final approval of all Land Withdrawal Designations on the Navajo Nation.

The Land Withdrawal Designation is hereby approved for five (5) years. Within ninety (90) days prior to expiration, you must notify and request another five (5) year withdrawal from Navajo Land Department (NLD). Thank you.

Sincerely,

W. Mike Halona, Department Manager III
Navajo Land Department
Division of Natural Resources

cc: Project Review



SAN JUAN CHAPTER

Lorenzo Bates
Council Delegate

Rickie Nez
President

Robert C. Begay
Vice President

Esther Keeswood-Begay
Secretary/Treasurer

Grace J. Chavez
Farm Board Member

Ramie Nelson
Grazing Member

October 6, 2016

Division of Natural Resources
Navajo Land Department – Project Review Section
Post Office Box 2249
Window Rock, AZ 86515
(928) 871-6447

Subject: Land Withdrawal Designation Package

Navajo Land Department:

This letter is written in support of the Land Withdrawal Designation for a proposed sand and gravel mine ("Mine") to be located on approximately 40 acres ("Project Site") within the land base of the San Juan Chapter. See attached map of the Project Site.

In December 2015, the San Juan Chapter approved a resolution reaffirming its support for the Mine, which is being developed by San Juan Sand and Gravel, LLC ("SJSG").

In support of this development, I performed a review of the Chapter's records to determine if there are any grazing permittees with valid grazing permits within the Project Site. Based on my review of the Chapter's records there are no grazing permittees holding valid grazing permits within the Project Site, thus, no consents are necessary.

If you have any questions, you may telephone me at the San Juan Chapter at (505) 960-0010.

Sincerely,

Mr. Ramie Nelson
Grazing Committee Member
San Juan Chapter

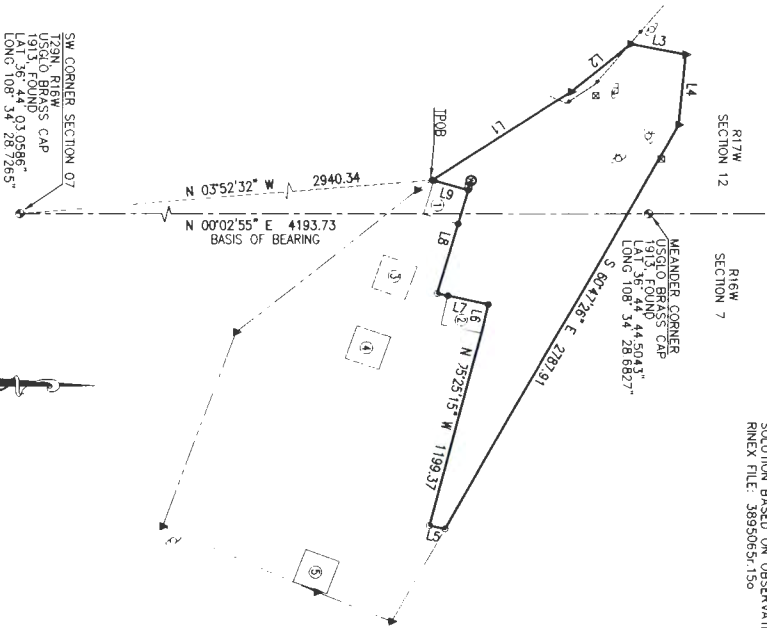
HOMESITE DATA

- ① USA ARISO
HS#24970
② CASILDA WARRA
ARISO
HS#24972
③ ELANE BACON
HS#24335
④ LA DONNA
ARISO
HS#24971
⑤ ELITA ROSE
JOHNSON
HS#30774

LINE	BEARING	DISTANCE
L1	N 33°25'42" W	969.01
L2	N 40°07'38" W	452.25
L3	N 11°09'21" E	328.66
L4	S 84°34'34" E	431.75
L5	S 12°44'46" W	92.45
L6	N 27°14'21" W	180.08
L7	S 12°47'21" W	305.08
L8	N 73°49'11" W	642.12
L9	S 16°10'50" W	217.18

LEGEND

- G.L.O. BRASS CAP FOUND, AS NOTED
○ 1/2" REBAR FOUND
○ 5/8" PIN & CAP NAIL FOUND
▲ POWER POLE
● GUY WIRE ANCHOR
● MONITORING WELL
● DH MARKER
— OVERHEAD ELECTRIC LINE
— UNDERGROUND WATERLINE



- NOTES
1. DATE OF SURVEY 3-12-15
2. DATE OF PROJECTION
TRANSVERSE MERCATOR
ORIGIN: LAT 36°44'03.0586" N,
NORTHING 10,000.00 FT
LONG. 108°34'28.7265" W, NAD83.
EASTING 10,000.00 FT
SCALE FACTOR: 0.99972967.
GEOGRAPHIC ORIGIN: OPUS
SOLUTION BASED ON OBSERVATION
RINEX FILE: 3895065.r150

LEGAL DESCRIPTION

A Tract located in the East half of Section 12, Township 29, North, Range 17 West, and the West half of Section 07, Township 29 North, Range 16 West, New Mexico Principal Meridian, in the vicinity of the San Juan, San Juan County, State of New Mexico being more particularly described as follows:
BEGINNING at the Southwest corner of Section 07, Township 29 North, Range 16 West, New Mexico Principal Meridian, monumented by a United States General Land Office Brass Cap, dated 1913;
Thence North 03° 52' 32" West a distance of 2940.34 feet to the TRUE POINT OF BEGINNING;
Thence North 33° 25' 42" West a distance of 969.01 feet;
Thence North 40° 07' 38" West a distance of 452.25 feet;
Thence North 11° 09' 21" East a distance of 328.66 feet;
Thence South 84° 34' 34" East a distance of 431.75 feet;
Thence South 60° 47' 26" East a distance of 2787.91 feet;
Thence South 12° 44' 46" West a distance of 92.45 feet;
Thence South 75° 25' 15" West a distance of 1199.37 feet;
Thence North 77° 14' 21" West a distance of 180.08 feet;
Thence South 12° 47' 21" West a distance of 305.08 feet;
Thence North 73° 49' 11" West a distance of 642.12 feet;
Thence South 16° 10' 50" West a distance of 217.18 feet to the TRUE POINT OF BEGINNING;
CONTAINING 1,742.405 Square Feet or 40.00 Acres more or less.

BASIS OF BEARING

AS MEASURED BEINGS BETWEEN
THE MEANDER CORNER AND THE
MEANDER CORNER ALONG THE
WEST LINE OF SECTION 7, T-29-N,
R-16-W, N.M.P.M., SAN JUAN, SAN
JUAN COUNTY, NEW MEXICO
LINE BEARS N 00° 02' 55" E, A
DISTANCE OF 4193.73 FEET.

CERTIFICATION

I RICHARD D. TABOR, A REGISTERED PROFESSIONAL LAND
SURVEYOR UNDER THE LAWS OF THE STATE OF ARIZONA,
CERTIFY THAT THIS SURVEY WAS PREPARED FOR AN
OWNER OF THE LAND, AND THAT I AM RESPONSIBLE FOR THE
DIRECT SUPERVISION THAT I AM RESPONSIBLE FOR THIS
SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF.



SAN JUAN SAND & GRAVEL TRACT

271-10 SAN JUAN SAND & GRAVEL-RTS 2015-04-09

40.00 ACRES

DISTRICT 12, NAVAJO INDIAN RESERVATION, PO BOX 416
E 1/2 OF SECTION 12, 129N, R17W, N.M.P.M. MONTICUMA CREEK, UTAH
W 1/2 OF SECTION 07, 129N, R16W, N.M.P.M. 84534
SAN JUAN, SAN JUAN COUNTY, NEW MEXICO 970-570-5108

Hummingbird Survey, LLC
dhummingbirds@outlook.com



THE NAVAJO NATION

BEN SHELLY
PRESIDENT

REX LEE JIM
VICE-PRESIDENT

MEMORANDUM

TO: Howard P. Draper, Prog. & Project Specialist
Project Review Section/NLD

FROM: 
Rodger R. Paul, Right-of-Way Agent
Project Review Section/NLD

DATE: March 24, 2014

SUBJECT: *FIELD INVESTIGATION FOR SAND & GRAVEL PIT
San Juan, San Juan County, New Mexico*

The San Juan Sand & Gravel Company LLC, of Post Office Box # 3573, Gallup, New Mexico 87305 has submitted an application requesting to utilize forty (40.00), acres, more or less of Navajo Tribal Trust Land (NTTL) to establish a Sand & Gravel Pit, a 4.3 acres, more or less for an access road for ingress and egress to the pit. The proposed site is located within East Half (E1/2) of Section 12, T29N, R17W, & West Half (W1/2) of Section 07, T29N, R16W, San Juan, San Juan County, New Mexico.

The Project Review Section/Chinle Land Department has conducted the field investigation on the above project, met with the affected chapter (San Juan Chapter) grazing committee member (Ramie Nelson) to identify the affected landuser (grazing permittee) affected by the proposed project, upon review of the map and according to Mr. Nelson records and knowledge there is no land user (grazing permittee) within the proposed site. All assigned land users (grazing permittees) within the proposed forty (40.00) tract are deceased and their grazing permits were never probated. Mr. Nelson stated that since the chapter (San Juan) passed a chapter resolution recommending the project for further processing, he also recommending the project for further processing. Memorandum attached from Mr. Nelson. My finding is there are two (02) finalize home site leases within the within the forty (40.00) acres tract. The BIA has approved the home site leases in April 09, 2002 for Lisa Arivso and her daughter Casilda Maria Arviso in July 19, 2002. Project Review Section/NLD, San Juan Chapter Officials, Sam Woods from San Juan Sand and Gravel Company had (03) three meetings terminating the homesite leases. During our 1st meeting we met with Mr. John Slim and family, Mr. Slim has an approved home site lease, but his home site lease is located out side the forty (40.00) acres tract and he also has a valid grazing permit. According to BIA records his Claim Use Area is also out the proposed site. During our 2nd meeting we met with Lisa Arviso and Elaine Bedonie on terminating and relocating Ms. Arviso home site lease. Ms. Arviso stated to give time to think about it and she

will checking into another site near Farmington area. Applicant (San Juan Sand & Gravel Co.) will pay for her application fee, survey fee and the archology studies fee. Bob Chester from Shiprock Land Department attended the meeting and explained the home site lease policy on terminating a homesite lease. Both home site were leases approved more than 10 years ago, annual rental payments were never paid and no developments are made. Elaine Bedonie has a home site near the proposed gravel pit and she is opposing to the project, her concerns are dust control how they will be affected by the dust during the operation, and the other concern is the nuisance. During our 3rd meeting Ms. Arviso never gave answer on what her plan was on terminating and relocating her home site lease. Ms. Casilda Arviso lives and going to school in Tucson Arizona and contacted her by phone and explained and update her about the project. San Juan chapter passed chapter resolution supporting and recommending the project for further processing. Contacted Rick Nez San Juan chapter president and inform him that the chapter (San Juan) needs to work with Shiprock Land Department and BIA on terminating the two (02) homesite leases.

Should you have any question please contact me at Chinle Land Department (928) 674-2315 or (928) 797-1835

cc: Office File



SAN JUAN CHAPTER

Lorenzo Bates
Council Delegate

Rickie Nez
President

Robert C. Begay
Vice President

Esther Keeswood-Begay
Secretary/Treasurer

Grace J. Chavez
Farm Board Member

Ramie Nelson
Grazing Member

TO: Rodger R. Paul, Right-of-Way Agent
Project Review Section/CNLD
Post Office Box # 2179
Chinle Arizona 8650

DATE: February 26, 2014

SUBJECT: *Land Withdrawal 40.00 ac. for Gravel Pit
San Juan, New Mexico*

Dear Mr. Paul

Per your request to provide this letter regarding the field investigation on the proposed project for San Juan Sand & Gravel Company, P. O. Box # 3573, Gallup, New Mexico 87305 requesting to utilize forty (40.00) acres, more or less of Navajo Tribal Trust Land (NTTL) to establish a gravel pit and 4.3 acres for an access road for ingress and egress, located within the vicinity of San Juan Chapter, San Juan County, New Mexico.

As a grazing committee member from the affected chapter (San Juan Chapter) I am aware of the proposed project, also the chapter (San Juan Chapter) is aware of the project. San Juan Sand & Gravel has present the project to the chapter and the has passed a chapter resolution supporting the project. Upon review of the proposed map, according to my records and knowledge there is no assigned land user (grazing permittee) within the proposed site. Lisa Arviso and Casilda Maria Arviso finalized home site lease within the proposed site, both home sites in were approved in 2000. Presently no development has been made on the property. Therefore I recommended the project for further processing.

Should you have any question(s) please contact me at San Juan Chapter House (505) 960-6916

cc: Office File

*Ramie Nelson
San Juan Chapter Grazing Com.*

San Juan Sand & Gravel

■ RECYCLE

■ SAND

■ GRAVEL

■ ROCK

■ CEMENT

■ ASPHALT

September 16, 2016

Division of Natural Resources
Navajo Land Department – Project Review Section
Post Office Box 2249
Window Rock, AZ 86515
(928) 871-6447

Subject: Land Withdrawal Designation Package

Navajo Land Department:

By this letter, San Juan Sand and Gravel, LLC ("SJSG") hereby submits its application for a Land Withdrawal Designation for industrial development to process sand and gravel materials on the approximately forty (40) acre parcel located within the San Juan Chapter of the Navajo Nation, and whose location is indicated in the attached legal survey.

Pursuant to the Land Withdrawal Designation Procedure, the following documents are attached for your review and consideration:

1. Proposal for the planned use of the land,
2. Legal survey indicating the location of the land to be withdrawn, and
3. Approved and signed supporting Chapter resolution (SANJ-2016-16 dated December 13, 2015)

Please provide notice of your approval determination by:

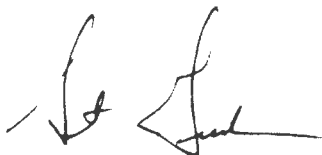
mail: Steve Gundersen
6991 E. Camelback Road, Suite B-308
Scottsdale, AZ, 85251

or

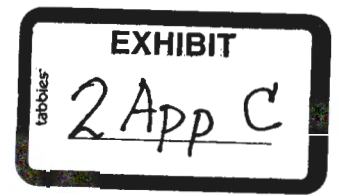
electronic mail: steve.gundersen@tallsalt.com

If you have any questions, please contact me at your convenience at (480) 433-9760 or steve.gundersen@tallsalt.com. Thank you for your consideration.

Sincerely,



Steve Gundersen
San Juan Sand and Gravel, LLC



Appendix C Land Survey and Project Maps

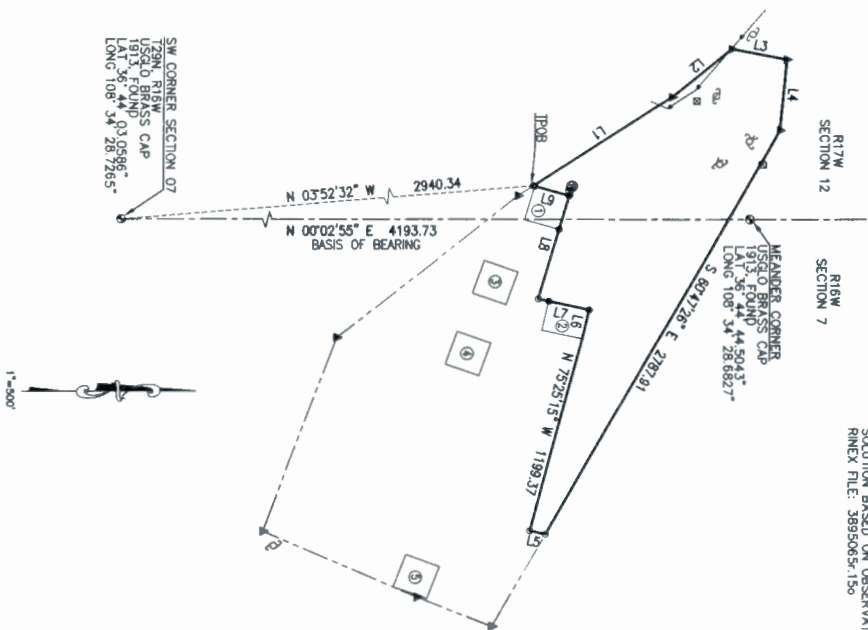
SAN JUAN SAND & GRAVEL PROJECT

- ① LISA ARRISO
HS#24970
- ② CASTILDA MARIA
ARRISO
HS#24972
- ③ ELAINE BADONI
HS#24335
- ④ LA DONNA
ARRISO
HS#24971
- ⑤ ELSTA ROSE
JOHNSON
HS#30774

LINE	BEARING	DISTANCE
L1	N 33°25'42" W	966.01
L2	N 40°07'58" W	452.25
L3	N 11°09'21" E	328.66
L4	S 84°34'34" E	431.75
L5	S 12°44'46" W	92.45
L6	N 77°41'21" W	360.08
L7	S 12°47'21" W	305.08
L8	N 73°49'11" W	642.12
L9	S 16°10'50" W	217.18

- ③ G.L.O. BRASS CAP FOUND, AS NOTED
- ④ 1/2" REBAR & TAG 19857 SET
- ⑤ 5/8" REBAR FOUND
- ▲ PIN & CAP IN/ILD FOUND
- Ⓣ POWER POLE
- > GUY WIRE ANCHOR
- Ⓢ MONITORING WELL
- DH MARKER

OVERHEAD ELECTRIC LINE
UNDERGROUND WATERLINE



1. DATE OF SURVEY 3-12-15
2. GPS PROJECTION =
TRANSVERSE MERCATOR
ORIGIN: LAT. 36.44403, 0566"N,
NORTHING 10,000.00 FT.
LONG. 108.3428, 7265"W, NAD83,
EASTING 10,000.00 FT.
SCALE FACTOR: 0.99972967,
GEOGRAPHIC ORIGIN OPUS
SOLUTION BASED ON OBSERVATION
RINEX FILE: 3895065.150

A Troat located in the East half of Section 12, Township 29 North, Range 17 West, and the West half of Section 07, Township 29 North, Range 16 West, New Mexico Principal Township, in the vicinity of the San Juan, San Juan County, State of New Mexico being more particularly described as follows:

CORNERING: at the Southwest corner of Section 07, Township 29 North, Range 16 West, New Mexico Principal Meridian, monumented by a United States General Land Office Brass Cap dated 1933.

THE POINT OF BEGINNING:

Thence South 87° 57' 32" West	distance of	2940.34 feet to
Thence North 33° 25' 42" West	distance of	959.01 feet
Thence North 40° 07' 36" East	distance of	452.25 feet
Thence North 11° 09' 21" East	distance of	328.66 feet
Thence South 84° 34' 34" East	distance of	431.75 feet
Thence South 60° 47' 26" East	distance of	2787.91 feet
Thence South 12° 44' 46" West	distance of	92.45 feet
Thence North 75° 25' 21" West	distance of	1199.37 feet
Thence North 77° 14' 21" West	distance of	180.08 feet
Thence South 12° 47' 21" West	distance of	305.05 feet
Thence North 73° 49' 11" West	distance of	642.12 feet
Thence South 16° 10' 50" West	distance of	217.18 feet to

THE POINT OF BEGINNING:

AS MEASURED BY GPS BETWEEN THE SOUTHWEST CORNER AND THE MEANDER CORNER ALONG THE WEST LINE OF SECTION 7, T-29-N, R-16-W, N.M.P.M., SAN JUAN, SAN JUAN COUNTY, NEW MEXICO. JUAN BEARS N 00° 02' 55" E, A DISTANCE OF 4193.73 FEET.

RICHAUD D TAYLOR, A REGISTERED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF ARIZONA, CERTIFY THAT THIS SURVEY PLAT WAS PREPARED FROM AN ACTUAL GROUND SURVEY PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION THAT I AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF.



EXPIRES 9-30-16

SAN JUAN SAND & GRAVEL TRACT

221-10 SAN JUAN SAND & GRAVEL-RST 2015-04-08

40.00 ACRES
DISTRICT 12, NAVAJO INDIAN RESERVATION
E 1/2 OF SECTION 12, T29N, R17W, N.M.P.M.
W 1/2 OF SECTION 07, T29N, R16W, N.M.P.M.
SAN JUAN, SAN JUAN COUNTY, NEW MEXICO

HUANGINGBO SURVEY LLC
PO BOX 416
MONTENZUMA CREEK, UTAH
84534
970-570-5108



**DIBE NIITSA LLC SAND & GRAVEL ACCESS
DISTRICT 12 - NAVAJO INDIAN RESERVATION
A PORTION OF WEST 1/2 SECTIONS 7 & 18, T29N, R16W, NMPM
SAN JUAN, SAN JUAN COUNTY, NEW MEXICO**

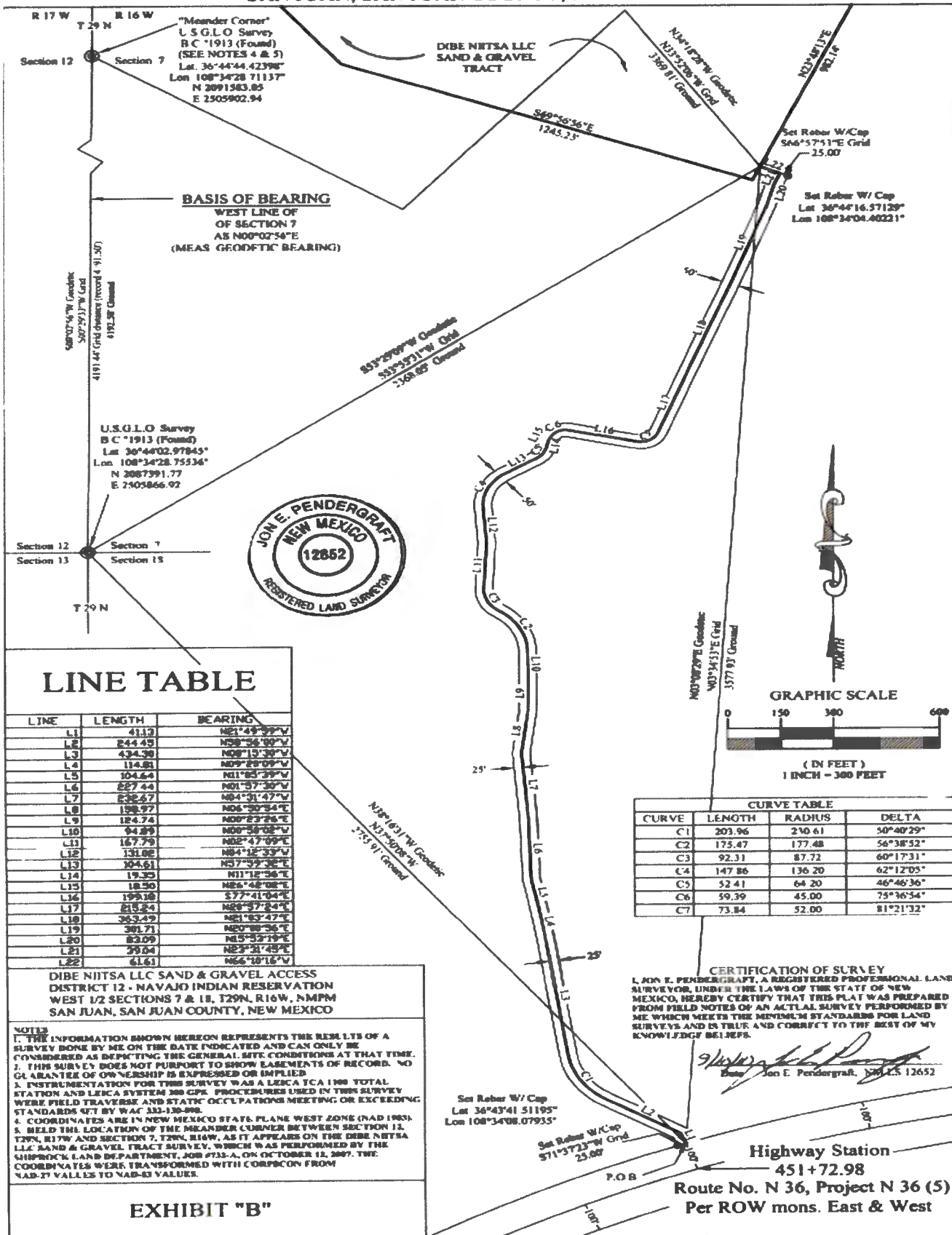


EXHIBIT "A" EASEMENT DESCRIPTION

A STRIP OF LAND FOR INGRESS AND EGRESS PURPOSES, FOR THE DIBE NITSA SAND AND AND GRAVEL LLC TRACT, DISTRICT 12, NAVAJO INDIAN RESERVATION, WHICH IS 50.00 IN WIDTH, BEING 25.00 ON EACH SIDE OF THE FOLLOWING DESCRIBED CENTER LINE SITUATED IN THE WEST HALF OF SECTIONS 7 AND 18, TOWNSHIP 29 NORTH, RANGE 16 WEST, NEW MEXICO PRINCIPAL MERIDIAN, IN THE VICINITY OF SAN JUAN, SAN JUAN COUNTY, STATE OF NEW MEXICO AND IS MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF HIGHWAY ROUTE No. N 36, AT HIGHWAY STATIONING 451+72.98 FROM WHICH THE NORTHWEST CORNER OF SAID SECTION 18, WHICH IS MARKED WITH A UNITED STATES GENERAL LAND OFFICE SURVEY BRASS CAP DATED "1913" (FOUND) THAT BEARS GEODETICALLY N38°16'31"W AND IS 2755.91 FEET DISTANT;

THENCE NORTH 21°49'59" WEST 41.13 FEET;
THENCE NORTH 58°56'00" WEST 244.45 FEET TO THE BEGINNING OF A CURVE TO THE RIGHT HAVING A RADIUS OF 230.61 FEET;
THENCE ALONG SAID CURVE 203.96 FEET THROUGH A CENTRAL ANGLE OF 50°40'29";
THENCE NORTH 8°15'30" WEST 434.30 FEET;
THENCE NORTH 9°20'09" WEST 114.81 FEET;
THENCE NORTH 11°05'39" WEST 104.64 FEET;
THENCE NORTH 1°57'30" WEST 227.44 FEET;
THENCE NORTH 4°31'47" WEST 232.67 FEET;
THENCE NORTH 6°50'54" EAST 158.97 FEET;
THENCE NORTH 0°23'26" EAST 124.74 FEET;
THENCE NORTH 0°50'02" WEST 94.89 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A RADIUS OF 177.48 FEET,
THENCE ALONG SAID CURVE 175.47 FEET THROUGH A CENTRAL ANGLE OF 56°38'52" TO THE BEGINNING OF A CURVE TO THE RIGHT
WHOSE CENTER BEARS NORTH 32°29'38" EAST 87.72 FEET;
THENCE ALONG SAID CURVE 92.31 FEET THROUGH A CENTRAL ANGLE OF 60°17'31";
THENCE NORTH 2°47'09" EAST 167.79 FEET;
THENCE NORTH 4°12'33" WEST 131.02 FEET TO THE BEGINNING OF A CURVE TO THE RIGHT HAVING A RADIUS OF 136.20 FEET;
THENCE ALONG SAID CURVE 147.86 FEET THROUGH A CENTRAL ANGLE OF 62°12'05";
THENCE NORTH 57°59'32" EAST 104.61 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A RADIUS OF 64.20 FEET;
THENCE ALONG SAID CURVE 52.41 FEET THROUGH A CENTRAL ANGLE OF 46°46'36";
THENCE NORTH 11°12'56" EAST 19.35 FEET;
THENCE NORTH 26°42'02" EAST 18.50 FEET TO THE BEGINNING OF A CURVE TO THE RIGHT HAVING A RADIUS OF 45.00 FEET;
THENCE ALONG SAID CURVE 59.39 FEET THROUGH A CENTRAL ANGLE OF 75°36'54";
THENCE SOUTH 77°41'04" EAST 199.18 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A RADIUS OF 52.00 FEET;
THENCE ALONG SAID CURVE 73.84 FEET THROUGH A CENTRAL ANGLE OF 81°21'32";
THENCE NORTH 20°57'24" EAST 215.24 FEET;
THENCE NORTH 21°03'47" EAST 363.49 FEET;
THENCE NORTH 20°00'56" EAST 301.71 FEET;
THENCE NORTH 15°53'19" EAST 83.09 FEET;
THENCE NORTH 23°31'45" EAST 39.04 FEET;
THENCE NORTH 66°10'16" WEST 61.61 FEET;

THE SOUTHERLY AND NORTHWESTERLY SIDELINES ARE TO BE TERMINATED ON THE NORTHERLY RIGHT-OF-WAY OF SAID HIGHWAY N36 AND THE EAST LINE OF SAID DIBE NITSA LLC SAND AND GRAVEL TRACT.

CONTAINING 4.92 ACRES, MORE OR LESS, IN AREA AND BEING TO ANY AND ALL EXISTING INGRESS OR EGRESS RIGHTS AND EASEMENTS FOR UTILITIES WITHIN OR ACROSS ANY PORTION THEREOF.

SURVEYED BY JON E. PENDERGRAFT, NEW MEXICO LICENSED PROFESSIONAL LAND SURVEYOR, JULY 31, 2010



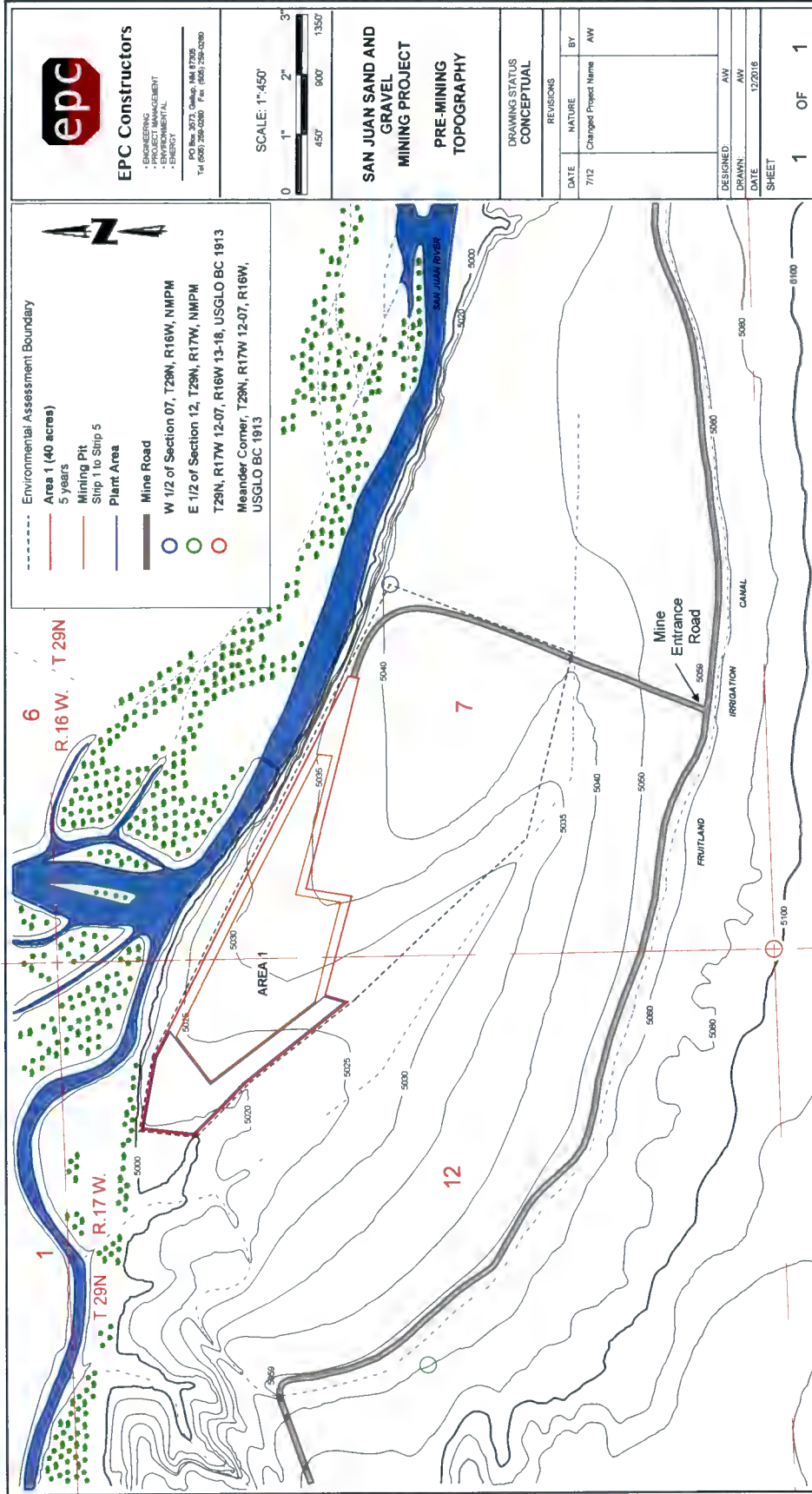
9/10/10

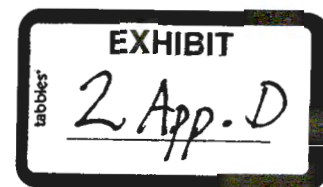


Google Earth

1045.5 ft

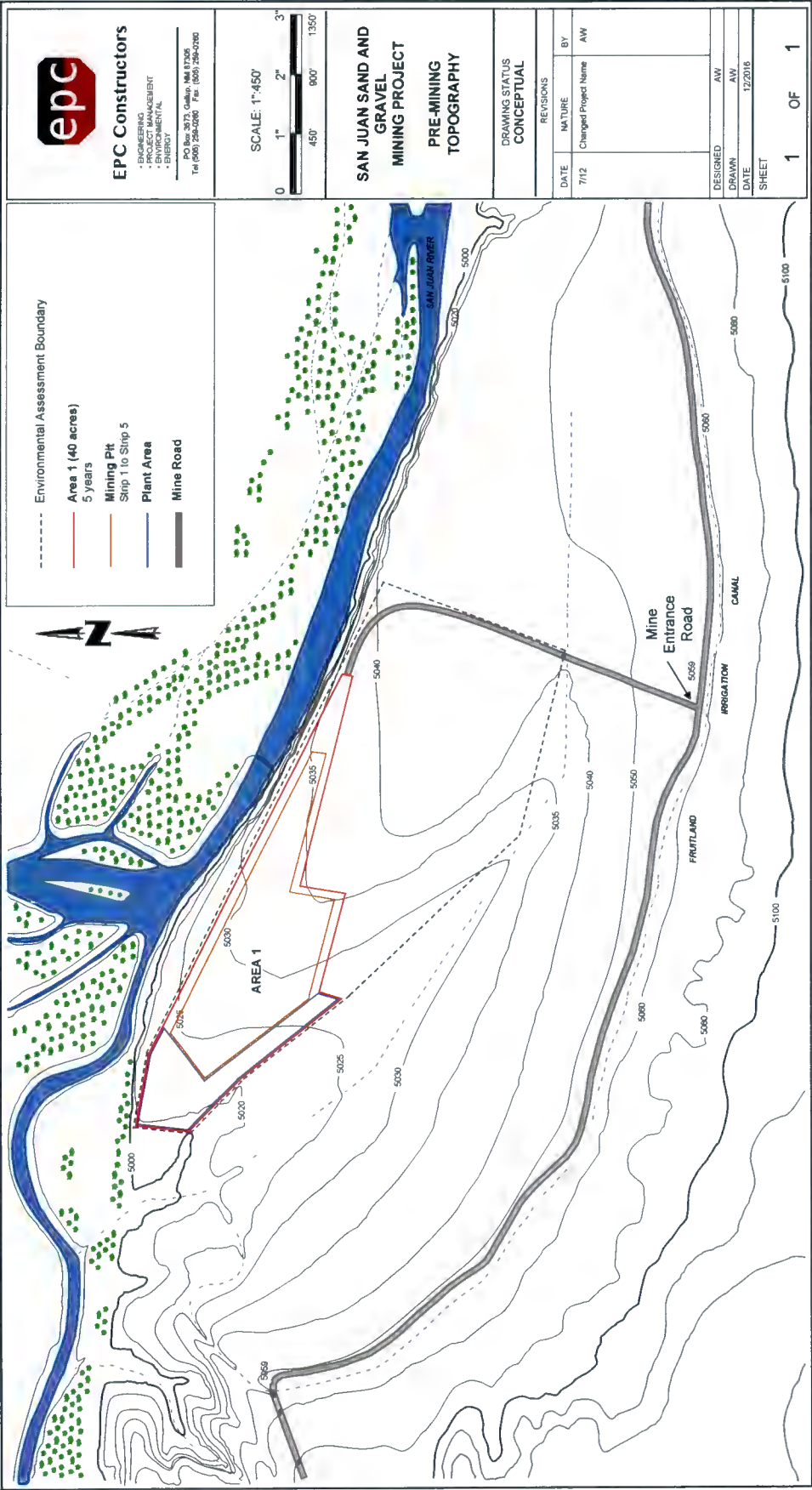


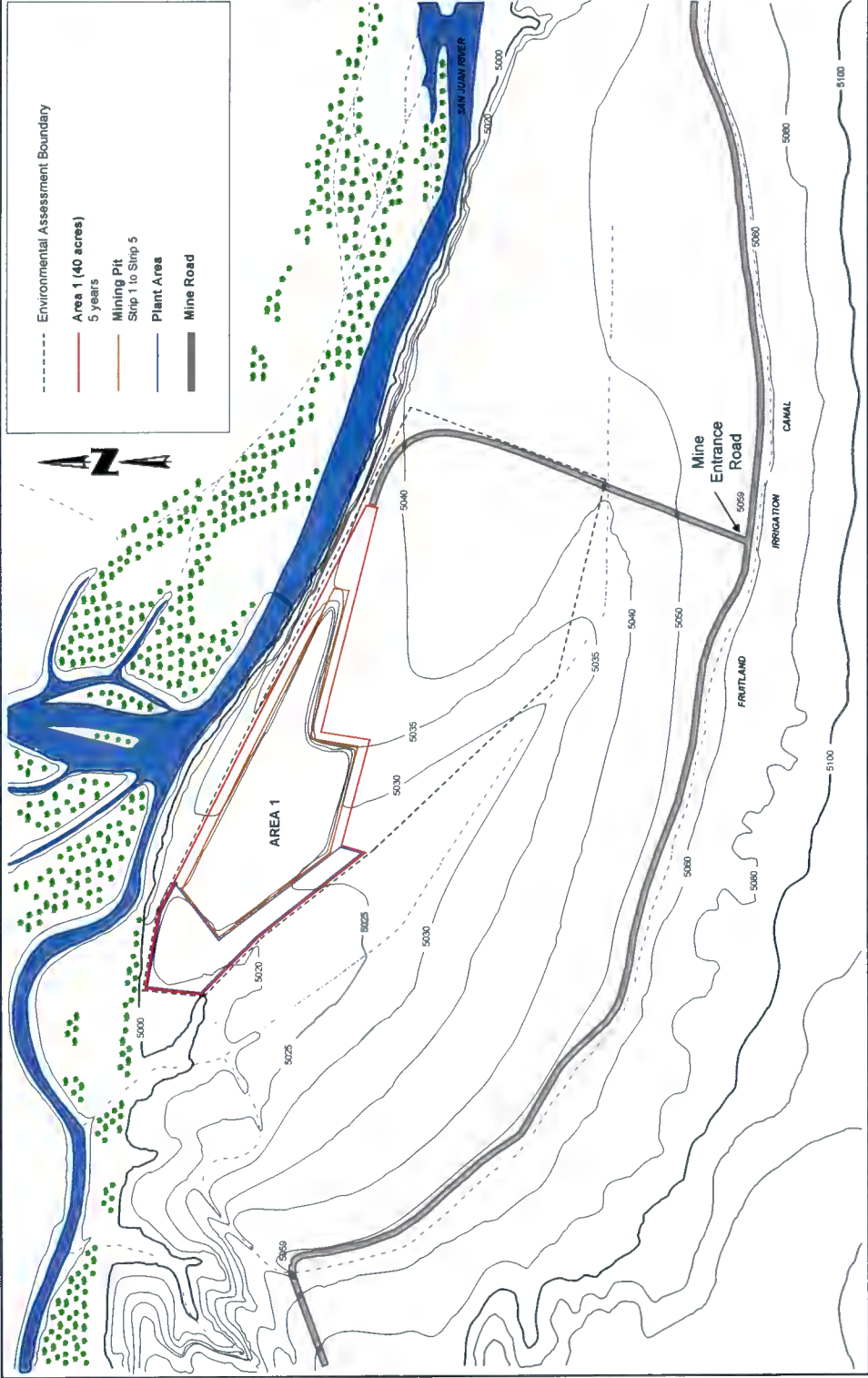




Appendix D Mine Plan Drawings

SAN JUAN SAND & GRAVEL PROJECT





EPC Constructors

• ENGINEERING
• PROJECT MANAGEMENT
• ENVIRONMENTAL
• DESIGN

PO Box 2073, Galien, MI 49735
Tel: (505) 254-0260 Fax: (505) 254-0260

SCALE: 1"=450'

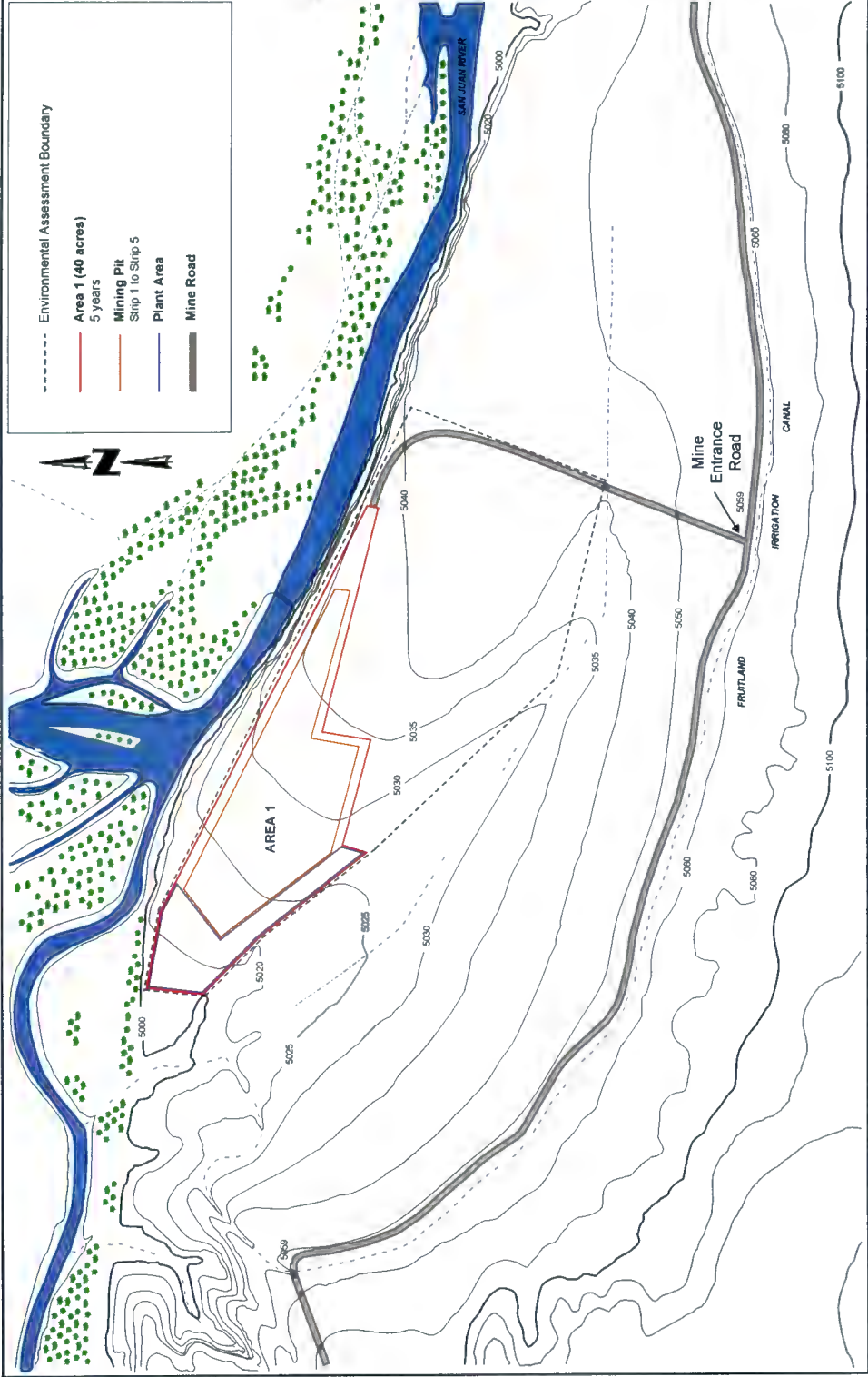


**SAN JUAN SAND AND GRAVEL
MINING PROJECT
INTERMEDIATE-MINING
TOPOGRAPHY**

DRAWING STATUS
CONCEPTUAL

REVISIONS	
DATE	NATURE
7/12	Changed Project Name
	BY
	AW

DESIGNED	AW
DRAWN	AW
DATE	12/2016
SHEET	1 OF 1



EPC Constructors

ENGINEERING
PROJECT MANAGEMENT
ENVIRONMENTAL
ENERGY

PO Box 3673, Ocala, FL 32065
Tel: (888) 258-0260 Fax: (888) 258-0260

SCALE: 1"=450'



**SAN JUAN SAND AND
GRAVEL
MINING PROJECT
POST-MINING
TOPOGRAPHY**

DRAWING STATUS
CONCEPTUAL

REVISIONS	
DATE	NATURE
7/12	Changed Project Name
BY	
AW	

DESIGNED	AW
DRAWN	AW
DATE	12/2016
SHEET	1 OF 1



EPC Constructors

- ENGINEERING
- PROJECT MANAGEMENT
- CONSTRUCTION
- ENERGY

PO Box 3673, Dallas, TX 75226
Tel: (959) 258-0280 Fax: (959) 258-0280

SAN JUAN SAND AND GRAVEL MINING PROJECT DEVELOPMENT DIRECTIONS BY STRIPS

DRAWING STATUS
CONCEPTUAL

REVISIONS	
DATE	NATURE
7/12	Changed Project Name
BY	
AW	

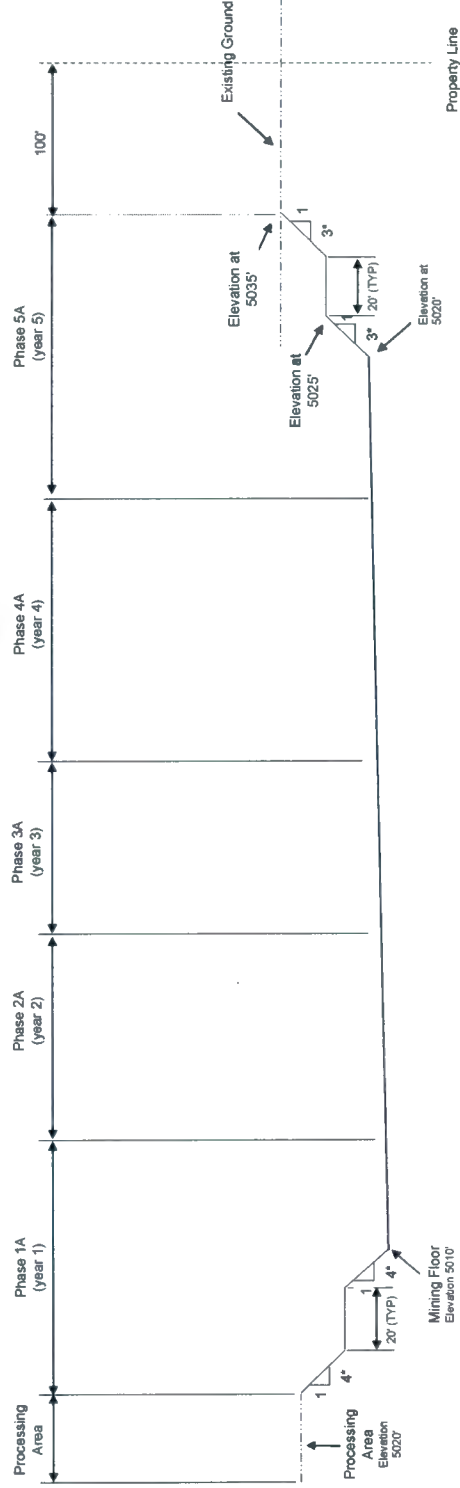
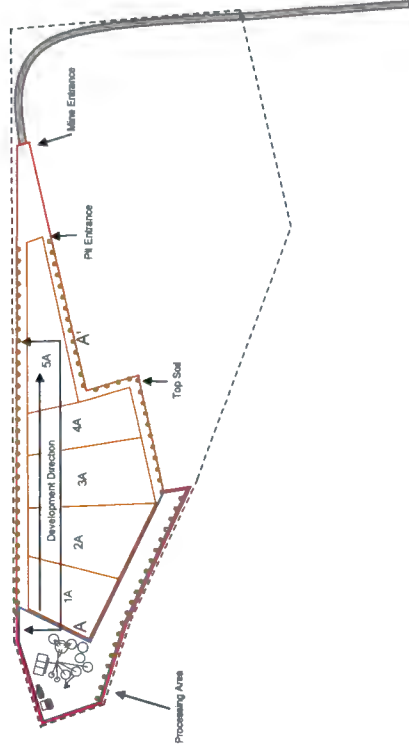
DESIGNED	AW
DRAWN	AW
DATE	12/2016
SHEET	

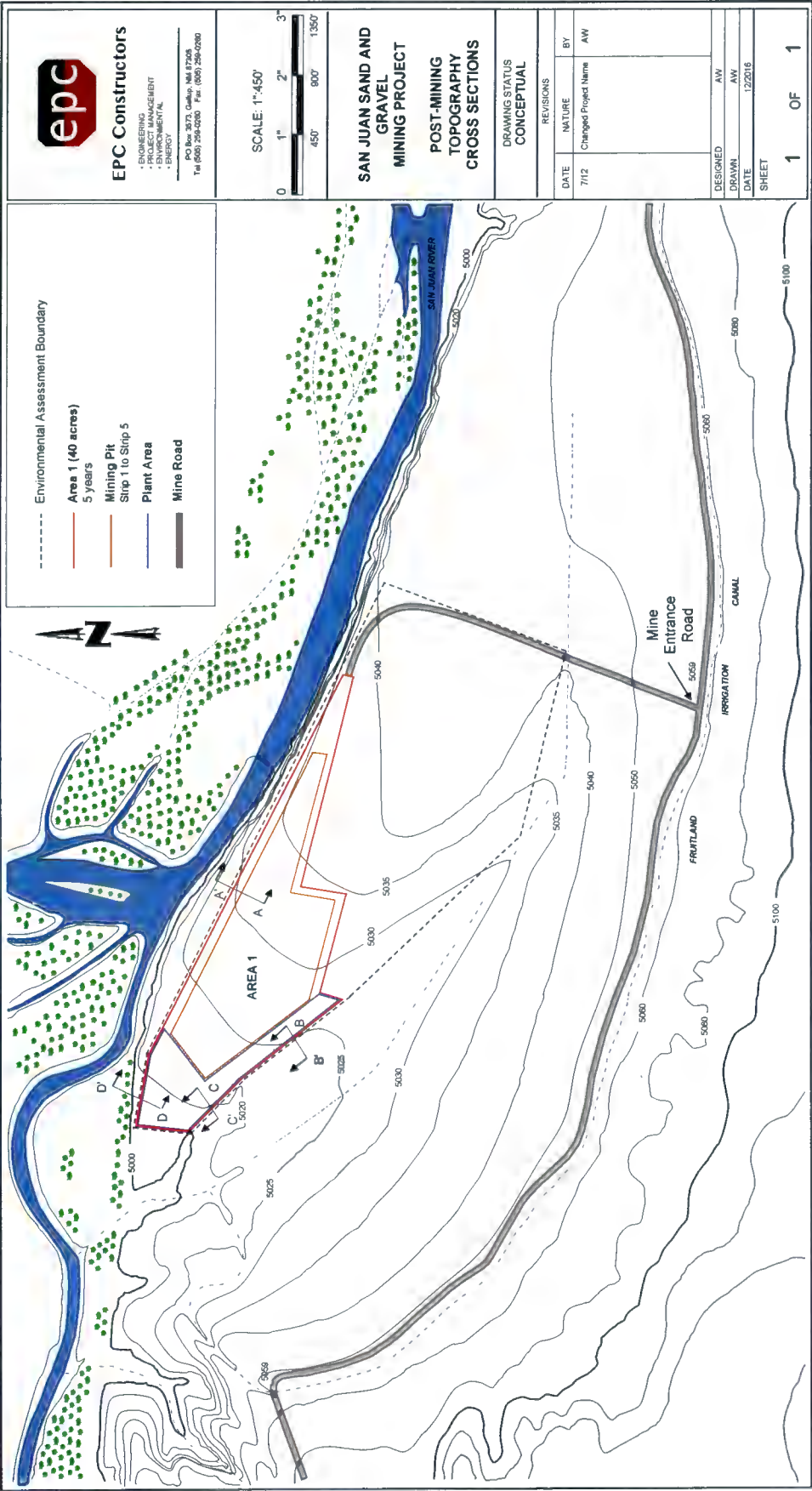
1 OF 1

- Environmental Assessment Boundary
- Overburden
- Mine Road

Notes:

1. Erosion prevention may include wattles, bales, or other technologies.
2. Slopes will be 3H:1V in various pit areas, not exceeding 5H:1V.
3. Overburden slopes will be 2H:1V.





EPC Constructors

ENGINEERING
PROJECT MANAGEMENT
ENVIRONMENTAL

PO Box 3873, Gallup, NM 87308
Tel: (505) 256-0200 Fax: (505) 256-0200

SCALE: 1"=450'

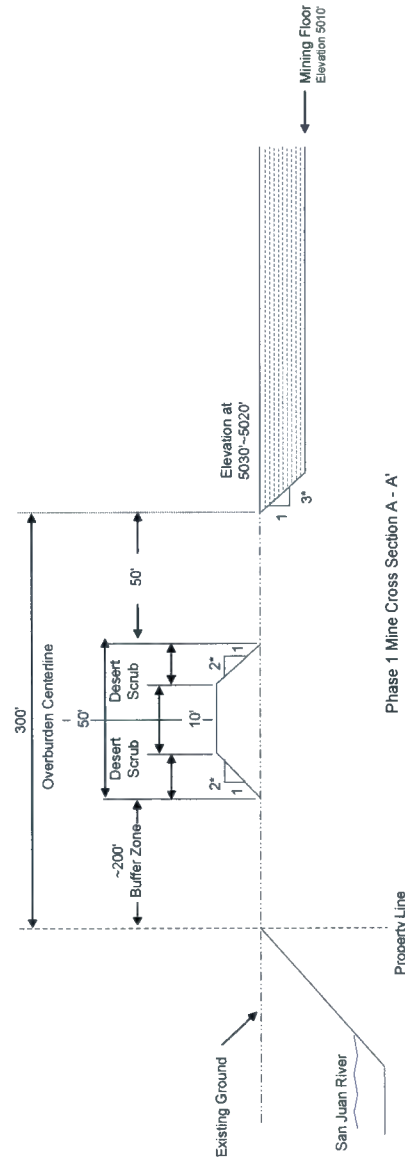
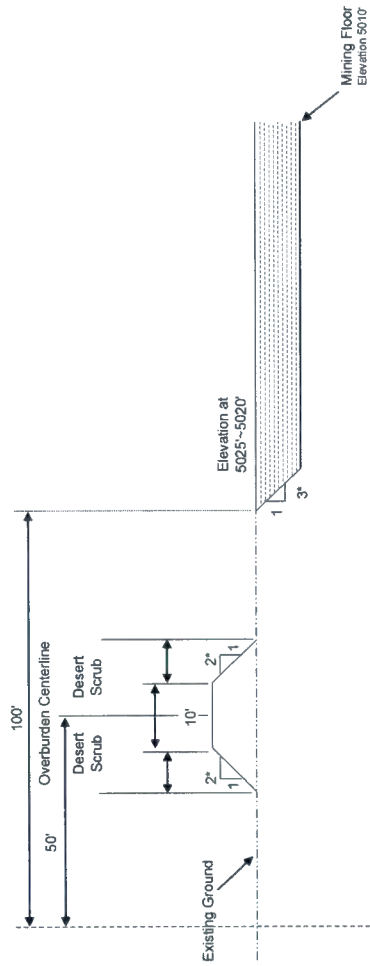


**SAN JUAN SAND AND GRAVEL MINING PROJECT
POST-MINING TOPOGRAPHY
CROSS SECTIONS**

DRAWING STATUS
CONCEPTUAL

REVISIONS	
DATE	NATURE
7/12	Changed Project Name
BY	
AW	

DESIGNED	AW
DRAWN	AW
DATE	12/2016
SHEET	



PLANT PALLETTE

Great Basin Desert Scrub Plant Community

- Four-winged saltbush
- Russian thistle
- Rabbitbrush
- Broom snakeweed
- Brome
- Indian ricegrass
- Alkali sacaton
- Kochia
- Scattered prickly pear
- Big galleta grass

Notes:

1. Boundary between habitat is approximate and may change based on field conditions.
2. Creation of benches or variation in the riverine may facilitate plant establishment.
3. Erosion prevention may include wattles, bales, or other technologies.
4. Slopes will be 3'H:1'V in various pit areas, not exceeding 5H:1V.
5. Overburden slopes will be 2'H:1V.



EPC Constructors

- **ENGINEERING**
- **PROJECT MANAGEMENT**
- **ENVIRONMENTAL**
- **ENERGY**

PO Box 3573, Gallup, NM 87305
Tel (505) 259-0260 Fax (505) 259-0260

SAN JUAN SAND AND GRAVEL MINING PROJECT

PROPOSED MINING CROSS SECTIONS

A - A' & B - B'

DRAWING STATUS
CONCEPTUAL

REVISIONS		
DATE	NATURE	BY
7/12	Changed Project Name	AW

DESIGNED	AW
DRAWN	AW
DATE	12/2016
SHEET	



Phase 1 Mine Cross Section D - D'

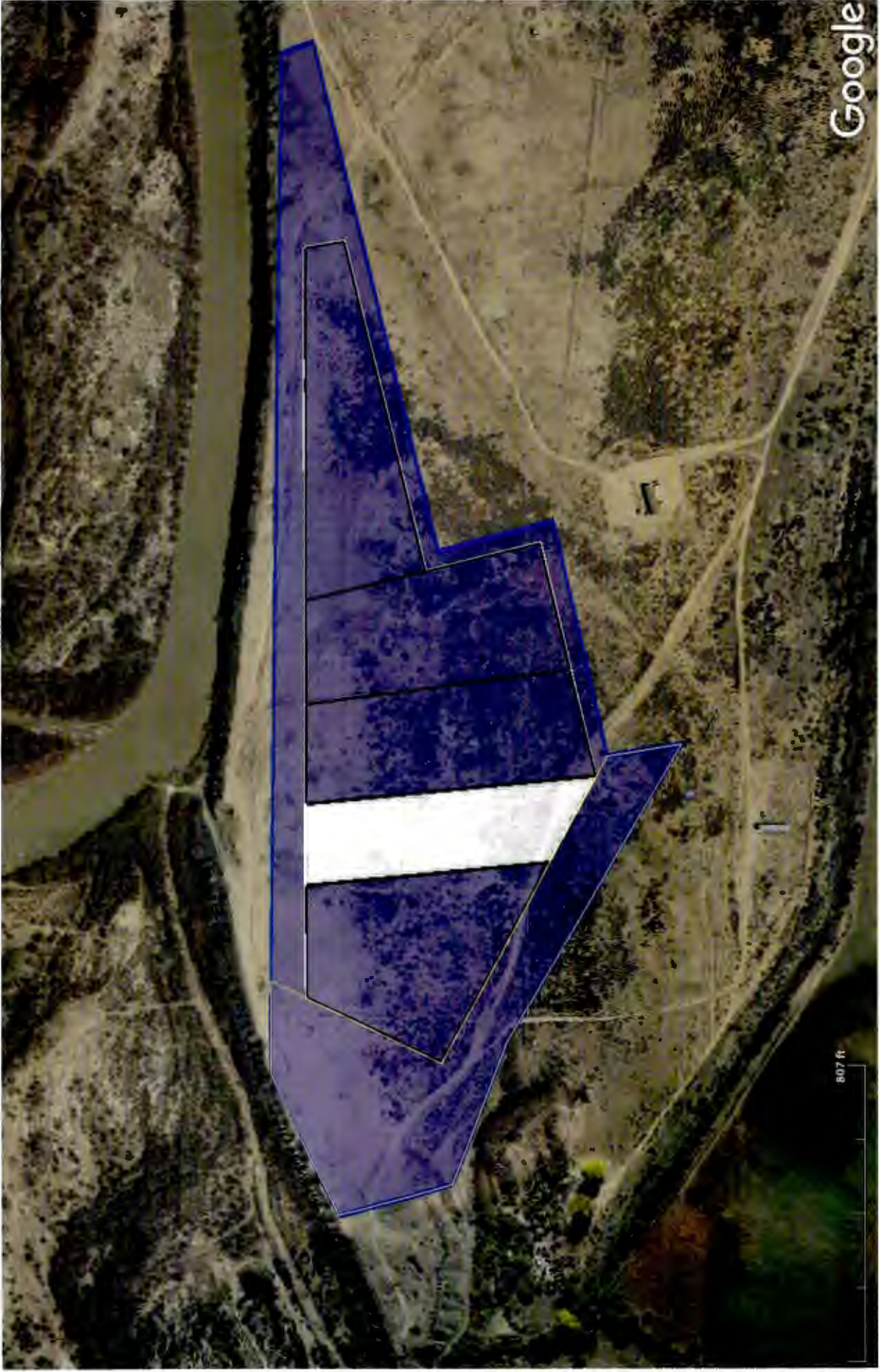
The diagram illustrates a cross-section of a mine. Key features include:

- Overburden Centerline:** A vertical dashed line indicating the center of the overburden.
- Desert Scrub:** A rectangular area with a width of 50' and a height of 200'.
- Buffer Zone:** A rectangular area with a width of 50' and a height of 200'.
- Existing Ground:** The ground surface on the left side of the diagram.
- San Juan River:** A wavy line representing the river on the right side of the diagram.
- Property Line:** A vertical dashed line separating the mine area from the river area.
- Mining Floor:** A horizontal line at the bottom of the mine, labeled "Mining Floor Elevation 5010".
- Elevation at 5025' - 5020':** A label indicating the elevation of the mining floor.
- Dimensions:**
 - Overall width: 300'
 - Overall height: 500'
 - Desert Scrub width: 50'
 - Desert Scrub height: 200'
 - Buffer Zone width: 50'
 - Buffer Zone height: 200'
 - Desert Scrub slope: 2°
 - Buffer Zone slope: 2°
 - Mining floor slope: 3°

Phase 1 Mine Cross Section D - D'



807 ft



Google

807 ft



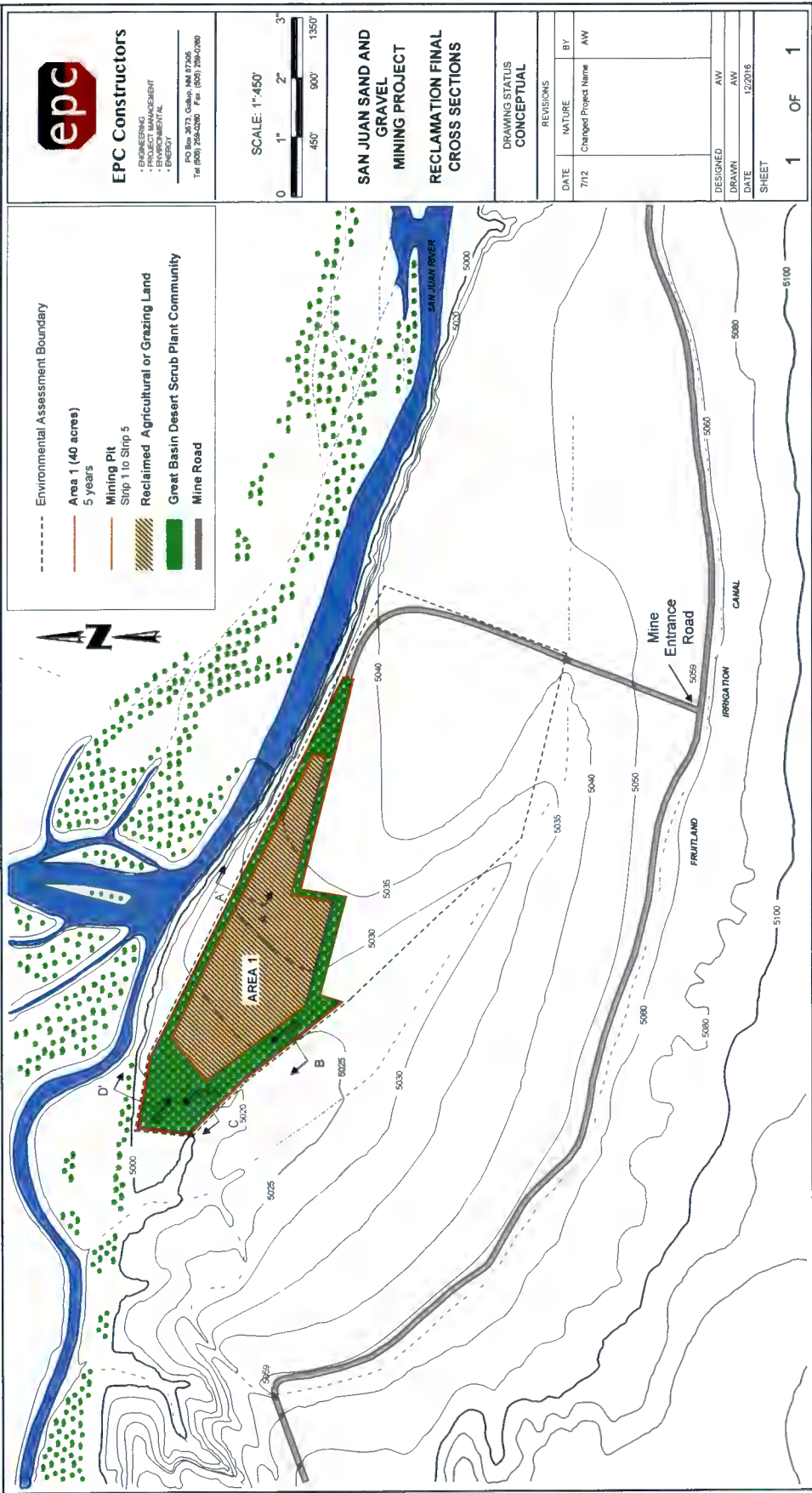


807 ft



Appendix E Reclamation Plan Drawings

SAN JUAN SAND & GRAVEL PROJECT



EPC Constructors

ENGINEERING
PROJECT MANAGEMENT
ENVIRONMENTAL
ENERGY

P.O. Box 3873, Gallup, NM 87306
Tel: (505) 756-0260 Fax: (505) 756-0260

SCALE: 1"=450'



**SAN JUAN SAND AND
GRAVEL
MINING PROJECT
RECLAMATION FINAL
CROSS SECTIONS**

DRAWING STATUS
CONCEPTUAL

REVISIONS

DATE	NATURE	BY
7/12	Changed Project Name	AW

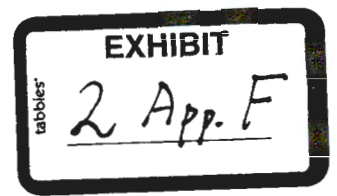
DESIGNED	AW
DRAWN	AW
DATE	12/2016
SHEET	

1 OF 1
SHEET



Phase 2 Reclamation Cross Section A - A'

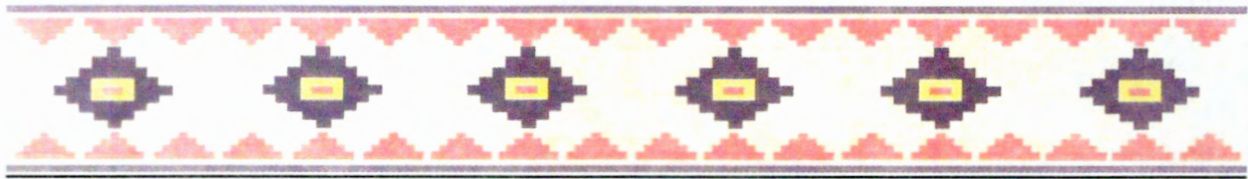
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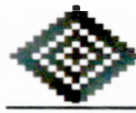
Appendix F Environmental Site Assessment

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"



Environmental Assessment



Prepared for

**Dibe Niista, Inc.
Sand and Gravel Operation
Shiprock, New Mexico**



Prepared by

**Native Planning & Environmental Services
P.O. Box 3944
Window Rock, Arizona 86515**

April, 2009

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ENVIRONMENTAL ASSESSMENT
Sand and Gravel Operation
Development of One Hundred Five Acres
Shiprock, New Mexico

1.0 PURPOSE and NEED FOR ACTION

Dibe Niista, LLC, Sand & Gravel, an enterprise that will be a supplier and processor of construction aggregate, asphalt and concrete materials. The company was established in 2007 and will enter the ready mix concrete business in 2009, with current operations within the Navajo Nation in New Mexico, Arizona and Utah. It is the company's mission to provide superior construction materials at a competitive price and will endeavor to supply sufficient quantities of requested project materials on time and within the project specifications.

Included as an overall site development will be the inclusion of all infrastructure construction, (water, sewer, electrical, drainage and street/road systems), which includes tying into existing community systems within a 30' easements and establishing of access road.

In accordance with the legislative framework, all documentations have been collected and documented in accordance the National Environmental Policy Act of 1969, NEPA implementing regulations of the Council of Environmental Quality (CEQ) and other related NEPA environmental laws and authorities.

1.2 Need for the Proposal

There is a tremendous need for sand and gravel resources through the Navajo Nation and within the Four Corners area for the vast amount of construction activities. Sand and gravel material are the basic materials used in most construction activities. Aggregate and stone mining produces materials that are used in road construction (aggregate, base course, crushed rock, sand and gravel); building construction and landscaping (topsoil, fill dirt, rip rap, scoria, travertine, dimension stone); and other general construction uses. The economics of construction depend primarily on the location of where materials are going to be transported and it is with this in mind that Dibe Niista, LLC will provide quality material. Dibe Niista, LLC has obtained a land lease for 105 acres and proposed to disturb the entire 105 acres of surface. The propose timeframe for production varies from five to fifteen years.

1.3 Objectives of the Proposal

The purpose of this proposal is to provide quality aggregate products at a reasonable price. To develop a product that will meet the need of customers within the Navajo Nation and Four Corners area. The material to be produced includes:

- ❑ Construction aggregate
- ❑ Washed aggregate
- ❑ Decorative rock
- ❑ Top soil
- ❑ Riprap

- ❑ Ready mix concrete
- ❑ Custom HMA-Hot Mix Asphalt
- ❑ Filtered Sand
- ❑ Custom aggregate crushing operations
- ❑ Custom ready mix operations.

The operation of this sand & gravel will comply with all permits under the Navajo Nation, The Bureau of Indian Affairs, as stipulated in 25 CFR, Part 211.3. This includes applying for sand and gravel permits leasing, obtaining water permits and other required documentation to run sand and gravel operation. A full detail of requirements is attached to this document known as "Navajo Nation Permitting Requirements".

Operations should follow the best management practice, that protects the environmental and interest of the Navajo Nation. Dibe Niista, LLC will have the northwestern portion of the 105 acres tract specifically for the administrative, storage, stockpiling and processing area. A map showing the location of this area is attached under Figure 2.7, Proposed Processing Area and Figure 3-2, Location of wells and mine pit area.

The mining operations will typically take place during daylight hours, Monday through Friday. Processed materials will be excavated from the mine pit to the processing area and products stockpile for consumer use. All mining and processing will be contained within the 105 acres. There will be portable office buildings and scales located in the northwestern portion of site. All utilities are on site, with existing 13.8kV three phase electrical lines and existing 4" waterline which will be rerouted to service the administrative area. See Figure 3-2, Location of wells and utilities. This proposed project will enable the employment of 10 – 15 individuals for the term of the lease/permit.

Water usage is inevitable in mining, so proposed project will have processed water, mine dewatering that will need to be processed. Batch plants (concrete, hot asphalt) associated with gravel mining operations could pose environmental concerns for pollutants to affect underlying ground water. Dibe Niista, LLC will take precautionary measures to protect surface and ground water by providing filtration, chemical and physical reactions and biological activity that will remove pollutants before water can enter ground water. A storm water pollution prevention plan will need to be put in place, with requirements attached in appendices.

Reclamation efforts will take place promptly once area is determined to be no longer productive. This would include minimizing or eliminating public safety hazards, stabilizing disturbed areas and providing post-mining surface conditions that would be consistent with long-term uses in the area. This should consist of established practices under a general permit for sand and gravel operation.

Dibe Niista, LLC will provide services to customers ranging from small one-person operation to large multi-national corporations.

1.4 Scope of this Environmental Analysis

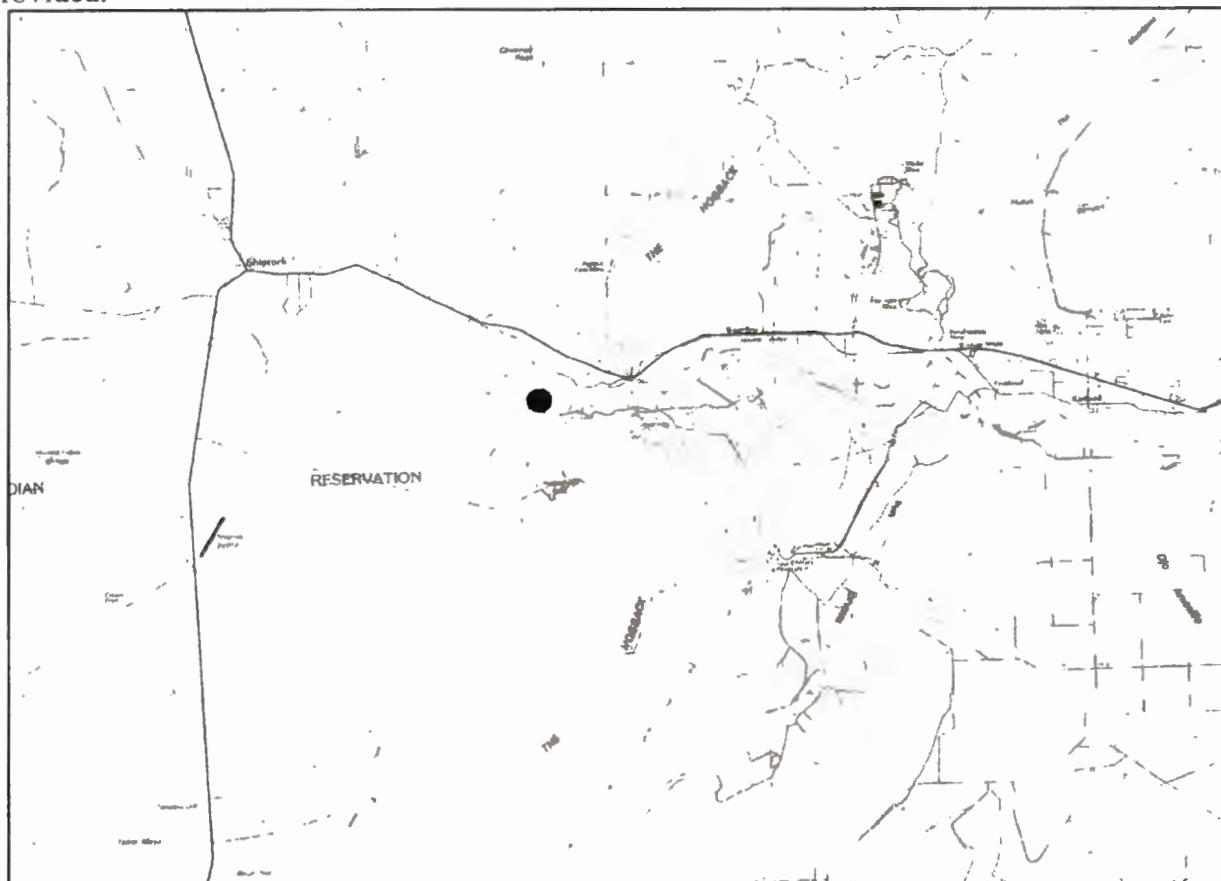
This environmental assessment will identify and evaluate the potential impacts to the human and surrounding environment, as a result of this development. All construction waste/debris will be hauled to an EPA approved landfill under contract services; and in accordance with local and federal laws and regulations. Disposal of construction debris in unapproved areas or burning of debris will not be allowed.

1.5 Decision

The Dibe Niista Sand & Gravel, LLC will submit this Environmental Assessment for approval to the BIA Environmental Services, Navajo Area Office, Gallup, NM for determination of Finding of No Significant Impact and proceed further for approval by the Navajo Nation.

1.6 Location

A USGS 7.5 minute quad map is available under Tab 3, which shows the location of proposed project site, along with photos of the area. Project is located within the East half of Section 12, T29N, R17W and the West half of Section 07, T29N, R16W, New Mexico principal meridian, San Juan County, encompassing of 106.61 acre(s), more or less. The site has been surveyed by the Navajo Shiprock Land Department in October, 2007; legal plat with description of tract is provided.



2.0 Alternatives

- a. The preferred alternative is to develop within the proposed site that was approved by the Shiprock Chapter, due to the difficulty in obtaining land that is suitable for construction. The area is within proximity of available infrastructure and in an area that was previously used for intended purpose.
- b. Reasonable alternatives
 - No Action Alternative
The “No Action” alternative will deter economic growth for the community and will further impact the resources for construction activities throughout the Navajo Nation and the Four Corners area. This alternative will negatively impact the social and economic qualities of life of the clients and families involve. Adverse impacts will result to the human environmental from the “No Action” alternative and this is contrary to the ongoing effort of the Dibe Nistsaa, LLC.
 - Alternate Locations
There was no alternate location identified by the Chapter, due to other sites being inappropriate for the project and the long process necessary to acquire available land, this was not considered. There also remained the timelines of extensive studies and lease approval processes.

3.0 Description of Affected Environment

3.1 Land Resources

1. Topography: The site topography for proposed development is leveled, but slightly sloping at 1% to the north, and area can generally be characterized as being in a relatively narrow valley bordered by a series of terraces which extend to the upland plateaus. The project area has extensive ground disturbances from daily activities related to vehicular, human and animal use. The site includes several existing home sites and is adjacent to the San Juan River.
2. Soils: The soil is classified as river wash, which includes stabilized sandy, silty, graveled plains. The site predominantly contains gravel, cobbles and boulders that are hard and rounded.
3. Geologic Setting and Mineral Resources: The geology of the San Juan Basin is in age from Precambrian to Holocene. They consist of sandstone and shale and are overlaid with sand, gravel and cobble stones.

The project soil type is identified in Figure 3-1 below, which shows that the predominant soil is Mancos shale.

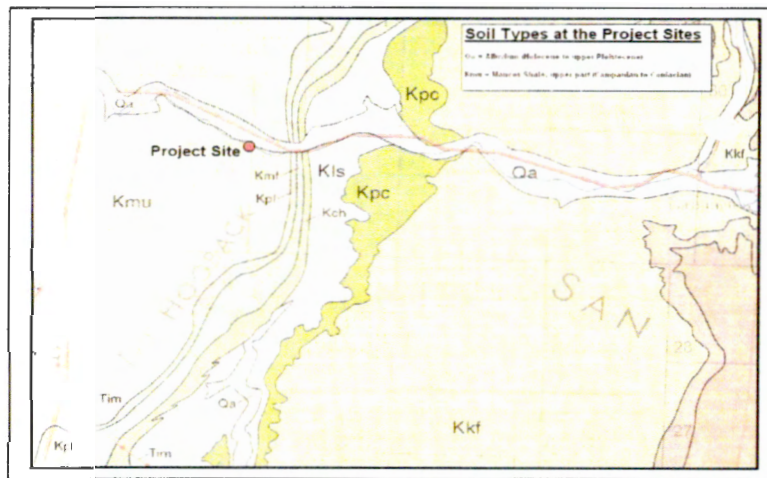


Fig 3-1

3.2 Water Resources

1. Surface Water – water resource in the area is the San Juan River, which runs adjacent to the project site. The river benefits the local agriculture and communities. The river is home to many species and provides a riparian habitat. Proposed project is located along the San Juan River and could impact riparian lands along the San Juan River. The San Juan River supports numerous aquatic plants and species in addition to the farming and domestic uses by local residents. This includes water diversion for farms and water hauling for live stocks. Consultation letter has been made with Water Resources, Navajo Nation EPA. A biological evaluation was performed by Ecosystem Management, Inc., which determined no threatened or endangered species to be impacted as a result of this project.
2. Clean Water Act, Section 402/404: Consultations has been made with the Navajo Nation EPA Office, attached under Tab 6. Dibe Niista Sand & Gravel will insure that all permitting requirements for Storm Water Pollution Protection are provided and the filing of a notice of intent prior to construction.
3. Floodplain Management (25 CFR 55, Executive Order 11988) – Proposed site is along the San Juan River and site is shown to be within the floodplain, however the site is approximately 30' above the river, see photos in "Site Info". "The soils within the area are not listed as hydric soils by the NRCS". This determination was made per Ecosystem Management, Inc. The project area is within the 100-year floodplain delineated by the Navajo Nation Water Resources Water Management Branch.
4. Wild and Scenic River Act (Section 7(b) and (c)) - There are no designated wild and scenic rivers located either on or within the Navajo Nation. The nearest designated river of wild & scenic rivers are located over 100 miles, near Santa Fe, New Mexico. This can be verified through www.rivers.gov.
5. Wetland Protection (Executive Order 11990) - Wetlands are areas that are inundated or saturated by surface or groundwater that are regulated under Section 404, and should exhibit three characteristics: hydrology, hydrophytes and hydric soils. The Biological Evaluation done by EMI also indicates that this project will not be impacting wetlands.

6. Sole Source Aquifers (Sage Drinking Water Act) - The criteria for meeting SSA designation are identified as 1) it must supply more than 50% of a community's drinking water, 2) it must be the only available local and regional source of drinking water. The Navajo Nation does not have any designated aquifers. The Shiprock area is being served by a community water system, maintained by the Navajo Tribal Utility Authority. Documentation related to sole source aquifers is attached in "NNEPA Docs".

3.3 Air Resources (Clean Air Act)

1. Air Quality - The proposed site is located within the boundaries of the Navajo Nation and therefore subject to the jurisdiction of the Navajo Air Quality Control Program of the Navajo Nation Environmental Protection Agency, for the purpose of air quality regulation. Proposed site is located in an area of attainment and will not impact the National Ambient Air Quality Standards. Source documentation is attached under "NNEPA Docs", which shows site location within the state within an "Attainment" area. The Navajo Nation operates and maintains air monitoring. As mandated by the Clean Air Act, USEPA, established air quality standards calls for six criteria air pollutants to protect the public from adverse affects associated with air quality. These criteria pollutants are: carbon monoxide (CO), sulfur dioxide (SO₂), Oxides of nitrogen (NO_x), Particulate matter (PM₁₀ and PM_{2.5}), Ozone (O₃) and Lead (Pb). Dibe NiiTsa, LLC will assure that they use the best management practice to control airborne particulate emissions, fugitive dust blowing from the uncovered or partially covered trucks, piles of sand and gravel, increase traffic to site.
2. Visibility – The primary cause of decrease visibility can be attributed to high particulate matter in the air, with common sources from windblown dust, and wild land fires and power plants. Other contributing factors to visibility are smoke from wood/coal burning stoves and are predominate only in the winter months. There is several power plants located in within thirty mile proximity and have been shown to generate large emission of visibility related pollutants. Other local sources of air pollutant include vehicle traffic on paves and unpaved roadways, oil & gas development activities, sand & gravel mining and processing operations and national climatic air patterns that transport pollutants from metropolitan areas. Within this project area, there are numerous unpaved roads which will contribute to the PM in the air, as well as those windy days that bring dust and dirt into the area.
3. Climate/Meteorology – The Shiprock Community, located on the Colorado Plateau is arid to semi-arid. The annual precipitation ranges from a few inches to less than ten inches. The average annual temperature for Shiprock is about 51 ° F, with very cold winters (October - March) and very hot summers (April – September). The average annual precipitation in Shiprock is 7 – 7 1/2 inches.

3.4 Biotic Resources – Threatened and Endangered Species

As a result of proposed site being adjacent or near existing homestead, the daily human activities within the area, domesticated animal in the area, the presence of plants and species are minimal. The Navajo Nation's Endangered Species List was reviewed proposed action and has issued a letter and biological compliance form stating compliance from the Navajo Nation Fish & Wild Life is attached under "Biological Eval". The firm, Ecosystem Management, Inc. performed the biological evaluation for proposed project.

3.5 Cultural Resources, Historic Preservation (36 CFR Part 800): A cultural resource inventory was done by Richard Burleson of Hammerstone Archaeological Services, on August 23, 2007. The Navajo Nation Historic Preservation Office, NNHPO has approved all reports and issues Notification to Proceed with conditions. See report under “Arch Rpt”.

3.6 Socioeconomic Conditions:

1. Employment Some of the major employers within the Shiprock community are the Navajo Nation, NAPI, APS/BHP Mines, Bureau of Indian Affairs, Indian Health Services, Community & public school and a few convenience stores. The official unemployment statistics for San Juan County is at 44%. Most of the employment can be found in neighboring communities requiring daily travel of 30+ miles per day, which can be a hardship on many families who do not own a reliable mode of transportation. Dibe Niista Sand & Gravel, Inc. will provide some temporary employment opportunities to a few individuals. The Navajo Nation currently has a 30-50% poverty rate, with jobs available only in boarder towns, municipalities. The Bureau of Indian Affairs, Indian Health Service and Navajo Nation Government offer various types of employment locally within these communities. There are also other private employment with small convenience stores, schools and construction work.
2. Demographics and Trends - The Navajo Nation spans across three states (Arizona, New Mexico and Utah). The Shiprock Community has a population of 3,066 identified by the 2000 Census with 96% of those being primarily Native Americans. Dibe Niista Sand & Gravel, Inc. will improve the trend by providing some employment opportunities during the construction activities that are associated with the production and sale of sand and gravel.
3. Community Infrastructure - There are seven schools (elementary to high school) and a community college (Dine College) in Shiprock, as well as a newly constructed health care facility. Shiprock has its own police and fire departments.
4. Lifestyles, Cultural Values, Attitudes: The vast majority of families who live within the Shiprock and surrounding community still sustain themselves with farming, sheep herding activities and sustain their Navajo Traditional Culture. With the high poverty and lack of available employment opportunities for the younger generation, the community lifestyles, cultural values of Navajo Life remain in tact with the elderly. Most of the younger generations move into bigger communities or to the cities to gain education and/or employment opportunities.

3.7 Environmental Justice: The propose action is not expected to raise environmental justice issues. the project is not causing disproportionately high or adverse human health or environmental effects on the minority populations or low income populations. The area was previously designated for purpose and is within rural community.

3.8 Indian Trust Resources: The proposed development is within a 105 acres parcel of land which proposes to impact trust resources (mining activities, water, air, fish, wildlife, rangeland, timber, minerals, or fossils) that may be considered vital assets to the Tribe. The location of the project site is along the San Juan River with five existing home site leased areas and existing housing structures and surrounding farming activities.

- 3.9 Environmental Module:** The Dibe Niista Sand & Gravel, Inc. will not be using any hazardous materials and non-mitigatable hazardous waste/substances WILL NOT be generated with the proposed development. Dibe Niista Sand & Gravel, Inc. will use the best management practice to deter environmental impact to the community.

Resource Conservation and Recovery Act, Subtitle C: Toxic Chemicals and Radioactive Materials (HUD Notice 79-33) Proposed project site is in rural community, with minimal development. Proposed site is clear of dumps, landfills, industrial sites and other facilities that would likely contain hazardous material. No impact or mitigation necessary for project undertaking. Dibe Niista Sand and Gravel, Inc. will not produce, use, store or handle any hazardous waste/material.

- 3.9.1 Resource Conservation and Recovery Act, Subtitle D: Solid Waste Sites** –The Navajo Nation Solid Waste Regulations provides oversight and prohibits disposal of any solid waste in a manner that will harm the environment and endanger the public health. Transfer stations are provided through the local Chapter House, with closure and mitigations ongoing for public open dumps. Solid waste generated by the construction of proposed project will be disposed of through contract services at an approved landfill. The Navajo Nation Solid Waste Regulations is attached in appendix.
- 3.9.2 Resource Conservation and Recovery Act, Subtitle I:** There are no underground storage tanks/sites as amended by the Hazardous & Solid Waste Amendments of 1984 within or adjacent to the proposed Dibe Niista Sand & Gravel, Inc. project development.
- 3.9.3 Explosive and Flammable Operations (24 CFR 518)** – Proposed project site does not have any explosive or flammable operations.
- 3.9.4 Comprehensive Environmental Response Compensation, and Liability Act and Superfund Amendments and Reauthorization Act of 1986:** A letter from the Navajo Nation Environmental Protection Agency is attached to confirm consultation regarding this requirement. The project is not on or near any National Priority List (NPL) sites found within a one-mile radius and no CERCLA sites found within a radius of 2000 feet. See Tab 6 for consultation with Navajo Nation EPA.
- 3.9.5 Toxic Substance Control Act:** A letter from the Navajo Nation Environmental Protection Agency is attached under “NNEPA Docs”, to confirm consultation regarding this requirement. The project is not on or near any National Priority List (NPL) sites found within a one-mile radius and no CERCLA sites found within a radius of 2000 feet. No impact or mitigation necessary for project undertaking. Dibe Niista Sand & Gravel Development will not produce, use, store or handle any hazardous waste/material.

3.10 Resource and Land Use Patterns

1. Hunting, Fishing and Gathering: The proposed development does not support hunting and gathering, as site is primarily rubble stones. There is potential for fishing, however the project does not impact the full span of the river where fishing could be done.
2. Timber Harvesting: The proposed development does not support timber harvesting, as the site is free of trees.

3. Agriculture, Farmland Protection Policy Act (7 CFR 658): Site visit to proposed project site confirms that project site will not include prime or unique farmland, locally or other farmland of local importance. Site was formerly designated as a gravel pit and thus has no farming activities. See photos for verification of site conditions.
4. Mining – There are no current mining operations or related activities located in the vicinity of the proposed site. The Dibe Niista Sand & Gravel proposes to mine sand and gravel as depicted by their plans.
5. Recreation – The proposed project site is in an area that are remote, and community members are content to taking care of their livestock, families and periodically attending family social gatherings, ceremonies and nearby community events sponsored by the Chapter or Community School or Faith-Based Groups. All other recreational type of events is located in the populated areas or in nearby border towns. The proposed project site is within a day drive of most hiking recreational spots. There could be some fishing, river rafting by local community members.
6. Transportation Use Network: The community of Shiprock lacks any public transportation. The community depends primarily on private transportation or hitchhiking with friends, relatives or travelers within the region. There is private health related transportation available for individuals requiring hospital visitations, but this transportation is only for those who are deemed eligible for reimbursement under health care systems.
7. Land Use Plans: The Dibe Niista Sand and Gravel, Inc. were required to present its plan to the Shiprock Chapter, who researched their own Land Use Plan to determine the best suitable area for Dibe Niista Sand & Gravel development. The proposed location is determined to be suitable for this development and in accordance with local land use plans. See attached resolutions passed by the Shiprock Chapter.

Residential Land Use – The Navajo Nation came up with the Land Use Planning Laws & Policy in July 1998, however many of the Chapters within the Navajo Nation have not met the requirements for certification. This planning initiative would enable the Chapters to identify Planning and Community boundaries in terms of resources (water quantity, quality, population, public facilities and financial administration). This is a huge undertaking on the part of the Navajo Nation due to the complexity of land base, grazing rights and customary use. The Shiprock Chapter is still working on getting certified by the Navajo Nation Government, however has established a community land use plan. It is through this planning tool that the Shiprock Chapter was able to identify the proposed site for development by Dibe Niista Sand & Gravel, Inc.

3.11 Other Values:

1. Wilderness: The proposed project location does not support any wilderness, as the proposed project site is within the community of Shiprock that is developed with housing and community facilities.
2. Sound, Noise and Abatement Control (24 CFR 51B) - The Dibe Niista Sand & Gravel, Inc. will make necessary accommodations to insure that noise generated by

operations of equipments are contained to normal business hours of 7:00 a.m. to 5:00 p.m., Monday through Friday for families who may live within surrounding area.

3. Public Health and Safety: The Shiprock community has two health care facilities, the Shiprock Indian Hospital and the Shiprock Community Health Care Center.

Police protection is provided by the Shiprock Police District, which is located within five miles.

The Dibe Niista Sand & Gravel, Inc. will insure that all safety measures are taken into consideration by establishing construction fencing and assuring that property boundaries are well maintained for the safety of the neighboring families.

4. Visual Setting: The proposed development design will take into consideration the surrounding environment, by establishing design standards that will minimize damage to surrounding lands.

4.0 Environmental Consequences of the Proposed Action (Impacts & Mitigations):

1. Land Resources: The proposed development will impact land resources within the immediate area of the proposed development. There is a plan to mine sand and gravel from the site and transport fill materials, gravel, concrete mix material to construction project sites. Dibe Niista Sand and Gravel, Inc. will supply and process construction aggregate, asphalt and concrete materials to contractors, homeowners and businesses within the four corners area.
2. Water Resources: The proposed development may adversely impact water resources. The Dibe Niista Sand & Gravel, Inc. will insure that Storm Water Pollution Prevention Plan is in place and file a Notice of Intent prior to construction activities. The project site will maintain a buffer zone of 60 meters between project and San Juan River.
3. Air Resources: The proposed development could have short-term, local impacts on air quality. These may include increased emission of CO, PM and hydrocarbons, which will cause some air quality concerns within the project area. Dibe Niista Sand & Gravel, Inc. will insure that air quality is preserve by having contractor water down any earthwork or grading that could compromise air quality during operation. Air quality impacts are expected to be confined within the project areas. They will use best management practices that will adhere to air quality standards.
4. Biological Impacts: The proposed development will not adversely impact biological environment per biological evaluation performed by Ecosystem Management, Inc. Dibe Niista Sand & Gravel, Inc. will keep 60 meters separation between project site and San Juan River to insure that critical habitat areas are not impacted.
5. Cultural Resources: Project was given a "Notification to Proceed Recommended" with "Conditions". The "conditions" are:

Sites NM-11-20-140, NM-H-20-141, NM-H-20-142:

1. Prior to any ground disturbances, the site boundaries will be flagged by a qualified archaeologist;

2. Sites will be avoided by fencing the site boundaries;
 3. Sites will be monitored by a qualified archaeologist during fencing and during all ground disturbing activities within 50 ft of the site boundaries;
 4. A brief letter/report documenting the result of the monitoring at the sites will be submitted to NNHPD/CRCs within 30 days of the monitoring.
6. Socioeconomic Conditions: The proposed development will not adversely impact the socioeconomic conditions. The project will provide positive impact that will provide employment opportunities for community members.
 7. Environmental Modules: The proposed development will not produce, use or store any hazardous materials, therefore will not require mitigation measures.
 8. Cumulative Impacts/Mitigation:
 - The development of this proposed site will have some impact to the land and vegetation within the proposed project area, which will be lost forever, but no threaten or endangered species will be affected.
 - There is a potential for air quality concerns due to the mining operation and establishment of new access road for transport of material.
 - There is the impact that will be imposed on the families and/or individuals who obtained home site leases within the 105 acres. The Dibe Niista, LLC has identified a "Relocation Plan" that will address how they will address the family/individuals that will be impacted by this development. Dibe Niista, LLC will provide fair and equitable compensation for relocation and re-establishment costs; to provide relocation assistance and current market assessment services; to simplify the process and avoid burdensome reporting and record keeping on the part of the displaced businesses and residents; to provide displaced businesses and residents with a reasonable degree of flexibility. The Relocation is attached in Tab .
 - Transportation route will need to be determined that will no impact local traffic.
 - Reclamation efforts are to be done once site is determined to be completed, and reclamation efforts should be done to restore the site as close to original topography.
 - If subsurface cultural resources are unearthed during mining, all activity within the vicinity of cultural resource will cease and the Navajo Nation Historic Preservation Office will be notified. For sites NM-H-20-140, NM-H-20-141, NM-H-20-142, provide qualified archaeologist for flagging of sites; fencing of sites; and monitoring reports as depicted above "Cultural Resources".
 - There will be a positive impact to the community population, as it relates to the overall growth and development of infrastructure within the community.
 - There will be some impact to the community while project is under construction, as it will bring forth employment opportunities, which also impacts sales and economic growth within the community.

5.0 Prepared by: Native Planning & Environmental Services
 Lydia Lee
 P.O. Box 3944
 Window Rock, Arizona 86515
 (928) 266-8451

6.0 Consultation

1. Sam Woods, DIBE NIISTA SAND & GRAVEL
2. Robert Whitehorse, DIBE NIISTA SAND & GRAVEL
3. Rita Whitehorse-Larsen, Environmental Specialist, NNEPA
4. Gloria Notah, Director, Navajo Nation Fish & Wildlife Department
5. Navajo Nation Fish & Wildlife Department
6. Judy Willetto, Range Conservationist, Navajo Department of Agriculture
7. Jimson Joe, Director, Department of Emergency Management

7.0 References

1. Navajo Nation Solid Waste Regulations, February 01, 1999
2. Chapter Images: 1996, Profile of 110 Navajo Nation Chapters.
3. Designated Sole Source Aquifers website: www.epa.gov/safewater/swp/reg9.html
4. Designated Wild & Scenic Rivers website: www.nps.gov/rivers/wildriverslist.html



**Appendix G Biological Resource Survey by Ecosystem
Management, Inc.**



SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"



**Biological Evaluation for Proposed 105 acre
Sand and Gravel Operation
Navajo Nation
Hogback, San Juan County, New Mexico**

April 2009



**Prepared for:
Native Planning
P.O. Box 3944
Window Rock, Arizona 86515**

**Prepared by:
Ecosystem Management, Inc.
4004 Carlisle Blvd NE, Ste. C-1
Albuquerque, New Mexico 87107**



NNDF&WL Review No. 05/07/09A

BIOLOGICAL RESOURCES COMPLIANCE FORM
NAVAJO NATION DEPARTMENT OF FISH AND WILDLIFE
P.O. BOX 1480, WINDOW ROCK, ARIZONA 86515-1480

COMPLIANCE	<input checked="" type="checkbox"/>
CONDITIONAL COMPLIANCE	<input type="checkbox"/>

It is the Department's opinion the project described below, with applicable conditions, is in compliance with Tribal and Federal laws protecting biological resources including the Navajo Endangered Species and Environmental Policy Codes, U.S. Endangered Species, Migratory Bird Treaty, Eagle Protection and National Environmental Policy Acts. This form does not preclude or replace consultation with the U.S. Fish and Wildlife Service if a Federally-listed species is affected.

PROJECT NAME & NO.: Hogback Sand and Gravel Operation

DESCRIPTION: Sand and Gravel Pit

LOCATION: Hogback Chapter

REPRESENTATIVE: Lydia Lee

ACTION AGENCY: Dibe Niista, LLC

B.R. REPORT TITLE / DATE / PREPARER: Ecosystems Management

SIGNIFICANT BIOLOGICAL RESOURCES FOUND: Project location within Colorado Pike Minnow and Razorback Sucker Critical Habitat but constituent elements of the critical habitat are not on project location so project will not effect those species.

POTENTIAL IMPACTS

TRIBAL ENDANGERED SPECIES (G2 & G3) TAKEN: NA

FEDERALLY-LISTED SPECIES AFFECTED: NA

OTHER SIGNIFICANT IMPACTS TO BIOLOGICAL RESOURCES: NA

AVOIDANCE / MITIGATION MEASURES: NA

CONDITIONS OF COMPLIANCE*: NA

FORM PREPARED BY / DATE: J. Cole 05/07/09

COPIES TO: (add categories as necessary)


- ☐ Navajo Environmental Protection Agency
☐ U.S. Fish and Wildlife Service, NM Field Office
☐ U.S. Fish and Wildlife Service, AZ Field Office

- ☐ BIA Navajo Region, Environmental Services
☐ U.S. Fish and Wildlife Service, UT Field Office
☐ (Other)

2 NTC § 164 Recommendation:

- ☒ Approval
☐ Conditional Approval (with memo)
☐ Disapproval (with memo)
☐ None (with memo)

Signature



Date 5-7-09

Gloria M. Tom, Director, Navajo Nation Department of Fish and Wildlife

NAVAJO BIOLOGICAL RESOURCES COMPLIANCE FORM

Page 2 of 2

*I understand and accept the conditions of compliance, and acknowledge that lack of signature may be grounds for the Department not recommending the above described project for approval to the Tribal Decision-maker.

Representative's signature

Date

Comments

- 1) Page 8 under Mesa Verde Cactus, you state that no cacti were observed during field surveys. When and who performed the surveys?
There was only suitable habitat survey conducted not Mesa Verde Cactus surveys. Restated as the following: No suitable habitat for the Mesa Verde cacti was observed during field surveys. The survey was conducted by Stephanie Lee, under supervision of Bill Hevron, on – list date.
- 2) Attached is a Federal Register notice re. Critical habitat for the fishes. Page 5, Primary Constituent Elements. You should include in your write up for the two endangered fishes that although the project site is within critical habitat, the project area does not contain any of the constituent elements, therefore, the project does not contain any of those elements.
Added for the razorback sucker and the Colorado pikeminnow: Although the proposed project area is adjacent to designated critical habitat, the project area does not contain any of the primary physical and biological attributes necessary for the species viability (i.e., constituent elements). Therefore, due to lack of suitable habitat there will be no effect to the razorback sucker through implementation of the proposed actions.
- 3) On page 10, it states that No floodplain will be impacted by the proposed action and on page 4, it states that the soils are alluvial. One would have to expect that those alluvial soils were laid down by the river.
On Page 4 added: The soils within the project area are Blackston-Camac-Rock outcrop complex, which exceeds a depth of 20 inches and are alluvium soils derived from sandstone, quartzite, granite, shale, and siltstone (USDA NRCS 2001). The soils within the project area are not listed as hydric soils by the NRCS. The project area is within the 100-year floodplain delineated by the Navajo Nation Water Resources Water Management Branch.
- 4) The document talks about BMPS and SWPPP's, but it would be best to have a buffer zone between the site and the river in case something fails, since we are dealing with a Critical Habitat.
On page 9 added: A buffer zone approximately 60 meters between the San Juan River and the proposed project area would be implemented to prevent impacts to the designated critical habitat for the Colorado pikeminnow and the razorback sucker. IS THIS FEASIBLE?
- 5) Document also talks about riparian vegetation adjacent to project site. How far outside of the site was habitat evaluated for the SWWF.
The survey area for suitable habitat included the areas just north of the project area on the opposite bank side. Added: The nearest designated critical habitat is approximately 144 miles southeast of the proposed project (i.e., Rio Grande-Middle Complex).

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1.0 INTRODUCTION

The proposed action is to develop sand and gravel operation within the 105 acre tract of land. The operation would produce sand, gravel, asphalt, and concrete. The proposed sand and gravel operation is located in the East ½ of Section 12 of Township 29 N, Range 17 W and the West ½ of Section 7 of Township 29 N, Range 16 W NMPM (NAD27, UTM 12N, Trimble GeoXT: SE corner 717195 E, 4068358 N; NE corner 717356 E, 4068776 N; NW corner 716292 E, 4069263 N; SW corner 716276 E, 4069160 N) at San Juan County, Hogback, New Mexico on the Navajo Nation (Figure 1). The project is located within the Nenannezad/San Juan Chapter.

2.0 METHODOLOGY

On 7 November 2008, a pedestrian survey was conducted by Stephanie Lee (EMI Biologist), under the supervision of Bill Hevron, of the proposed sand and gravel operation (Figure 2). The survey area included the approximately 105 acre sand and gravel tract. Dibe Niista, LLC sent a letter to the Navajo Fish and Wildlife Department (NFWD) to obtain a list of protected species that may occur within the project area. The response letter is included as APPENDIX B. The EMI biologist searched for protected animal species as well as raptors and passerine birds, and suitable habitat for protect plants and animals within project area. Photos were taken of the project area (APPENDIX A). The biologist also recorded the dominant plants in the project area.

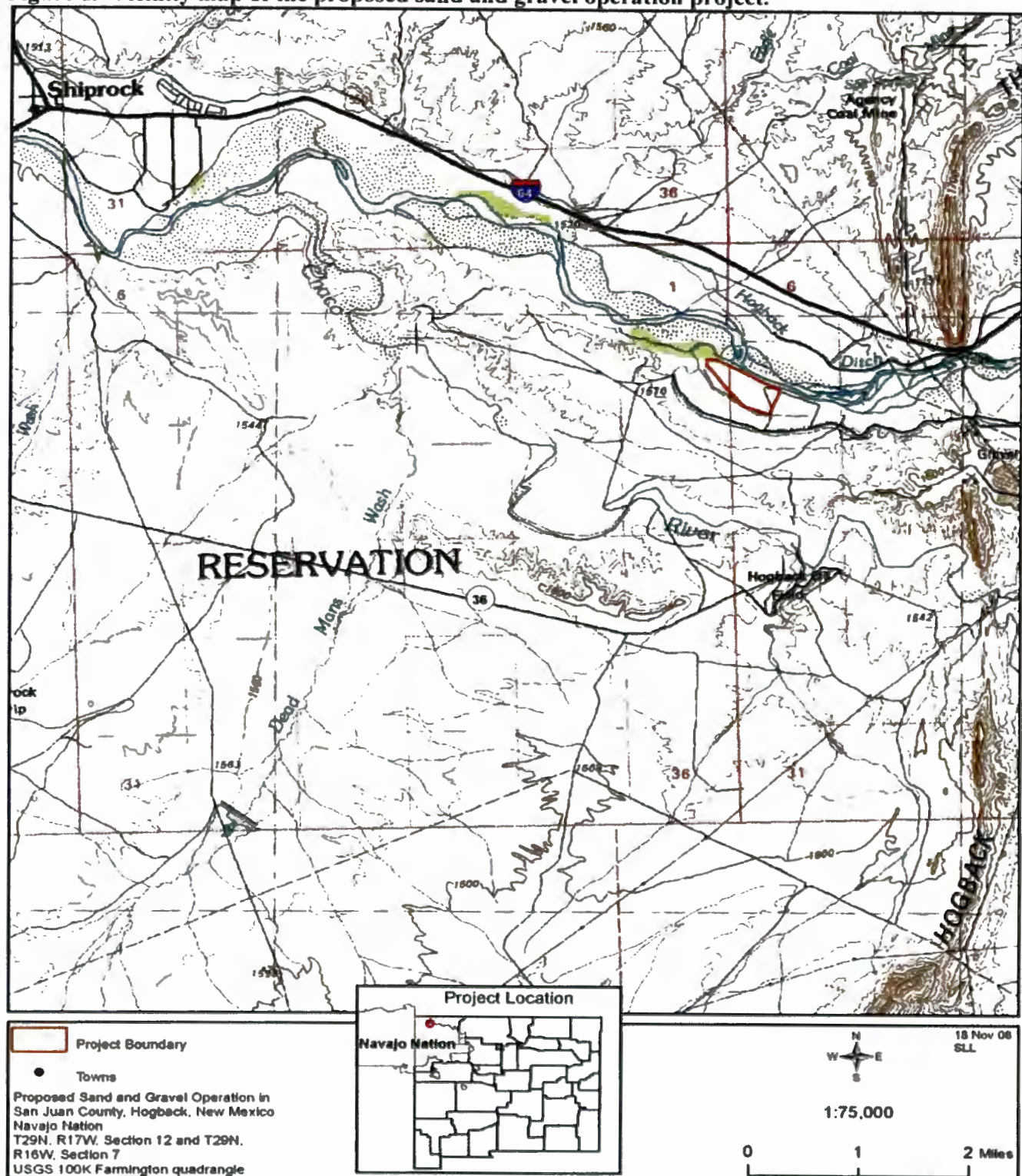
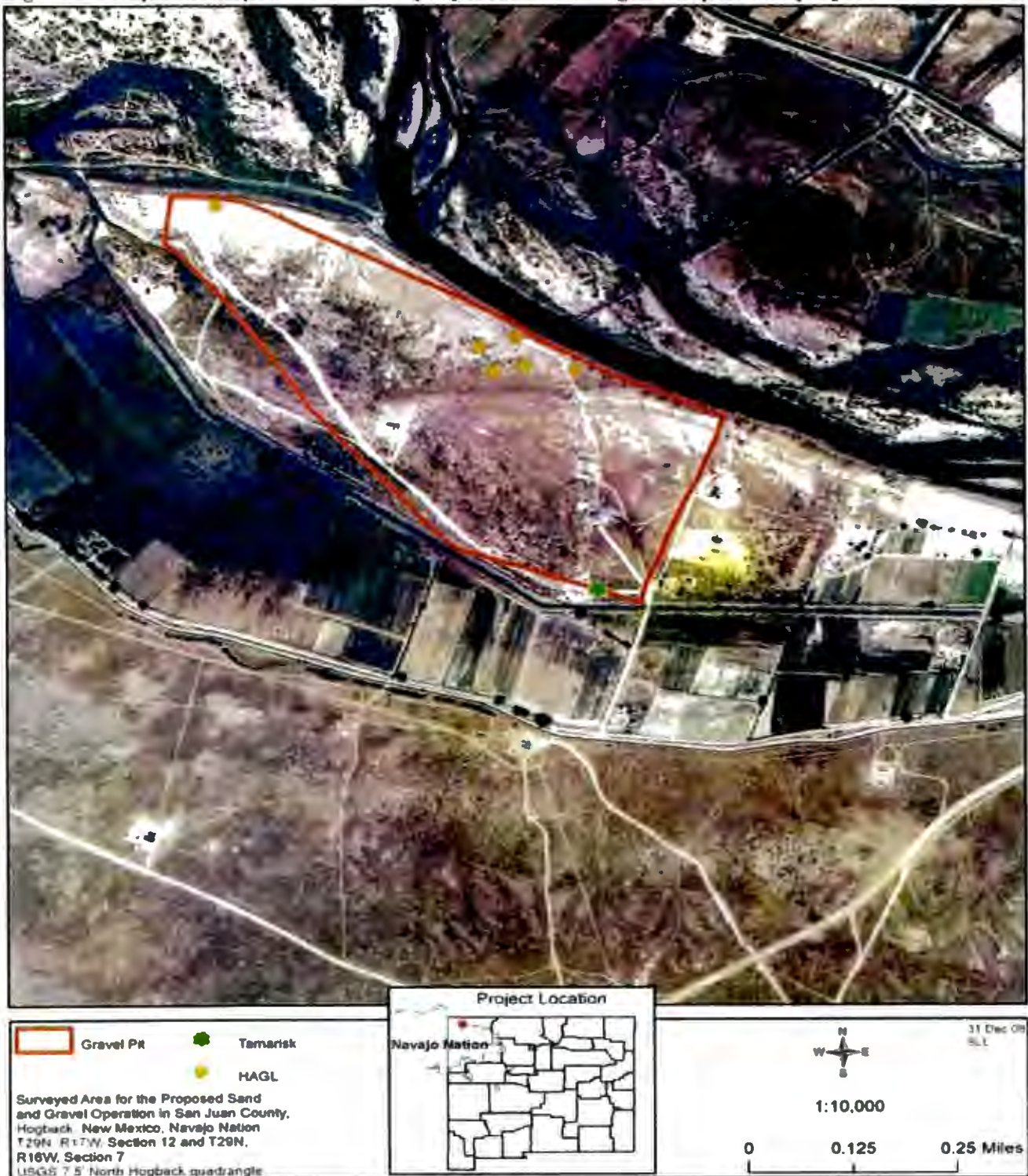
Figure 1. Vicinity map of the proposed sand and gravel operation project.

Figure 2. Map of surveyed area for the proposed sand and gravel operation project.

2.1 DESCRIPTION OF PROJECT AREA

The topography of the project area is fairly level with the hogback to the east. The elevation is approximately 5,025 feet (1,532 meters) within the project area. The soils within the project area are Blackston-Camac-Rock outcrop complex, which exceeds a depth of 20 inches and are alluvium soils derived from sandstone, quartzite, granite, shale, and siltstone (USDA NRCS 2001). The soils within the project area are not listed as hydric soils by the NRCS. The project site is derived from the upper part of the Mancos Shale Formation. The San Juan River, a perennial water body, is located adjacent (i.e., north) to the project area, but is physically separated due to the elevational difference created by the steep banks. There were no wetlands or riparian area within the project area. The project site drains to the south.

The project area falls within the Great Basin desert scrub plant community as defined by Dick-Peddie (1993). The dominant plants were four-winged saltbush (*Atriplex canescens*), Russian thistle (*Salsola kali*), rabbitbrush (*Chrysothamnus nauseosus*), broom snakeweed (*Gutierrezia sarothrae*), brome (*Bromus* spp.) Indian ricegrass (*Oryzopsis hymenoides*), alkali sacaton (*Sporobolus airoides*), Kochia (*Kochia scoparia*), scattered prickly pear (*Opuntia* spp.), many-headed groundsel (*Senecio spartioides* var. *multicapitatus*), and big galleta grass (*Hilaria rigida*).

The noxious weeds observed were halogeton (*Halogeton glomeratus*) and salt cedar (Figure 2), which are BIA Navajo Regional Office Noxious Weed Class B and C weeds, respectively. Class B weeds are new invaders with isolated occurrences. Management tools emphasized are immediate control, prevention of seed dispersal, and eradication of know populations/individuals. Class C weeds are well established and widespread. Management tools are limited to awareness.

3.0 SURVEY RESULTS

A list of protected species with the potential to occur in the project area was obtained from NFWF on 5 October 2008) by Dibe Niista, LLC. The NFWF classified the proposed project site as a moderately sensitive wildlife resource area. This means the area has a high concentration or potential for rare, endangered, sensitive, and game species throughout the landscape. The NFWF reported the southwestern willow flycatcher (*Empidonax traillii extimus*), Mancos milk-vetch (*Astragalus humillimus*), and Mesa Verde cactus (*Sclerocactus mesae-verde*) are known to occur within three miles of the proposed project site. In addition, the potential for 20 species of concern to occur within the project area needed to be evaluated.

Table 1. List of Protected Species with Potential to Occur in the Project Area

COMMON NAME	SCIENTIFIC NAME	STATUS*
Animals		
Black-footed ferret	<i>Mustela nigripes</i>	NESL G2; ESA E
Banner-tailed kangaroo rat	<i>Dipodomys spectabilis</i>	NESL G4
Kit fox	<i>Vulpes macrotis</i>	NESL G4
Bald eagle	<i>Haliaeetus leucocephalus</i>	ESA T; MBTA; EPA
Golden eagle	<i>Aquila chrysaetos</i>	NESL G3; MBTA; EPA
Ferruginous hawk	<i>Buteo regalis</i>	NESL G3; MBTA
Peregrine falcon	<i>Falco peregrinus</i>	NESL G4; MBTA
Western burrowing owl	<i>Athene cunicularia hypugea</i>	NESL G4; MBTA
Mountain plover	<i>Charadrius montanus</i>	NESL G4; ESA proposed T; MBTA
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	NESL G2; ESA E; MBTA
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	NESL G3; ESA C; MBTA
Belted kingfisher	<i>Ceryle alcyon</i>	NESL G4; MBTA
Yellow warbler	<i>Dendroica petechia</i>	NESL G4; MBTA
Northern leopard frog	<i>Rana pipens</i>	NESL G2
Bluehead sucker	<i>Catostomus discobolus</i>	NESL G4
Mottled sculpin	<i>Cottus bairdi</i>	NESL G4
Roundtail chub	<i>Gila robusta</i>	NESL G2
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	NESL G2; ESA T
Colorado pikeminnow Critical Habitat	<i>Ptychocheilus lucius</i>	Designated
Razorback sucker	<i>Xyrauchen texanus</i>	NESL G2; ESA E
Razorback sucker Critical Habitat	<i>Xyrauchen texanus</i>	Designated
Plants		
Mancos milk-vetch	<i>Astragalus humillimus</i>	NESL G2; ESA E
Mesa Verde cactus	<i>Sclerocactus mesae-verde</i>	NESL G2; ESA T
Naturita milk-vetch	<i>Astragalus naturitensis</i>	NESL G4
San Juan milkweed	<i>Asclepias sanjuanensis</i>	NESL G4

*EPA = Eagle Protection Act; ESA = Endangered Species Act; G3 = Group 3; MBTA = Migratory Bird Treaty Act; NESL = Navajo Endangered Species Act; T = Threatened

Black-footed ferrets are nocturnal animals that inhabit abandoned burrows of prairie dogs that represent the primary prey species. Only prairie dog towns over approximately 200 acres in size and with a density greater than 20 burrows per hectare are considered sufficient enough to support black-footed ferrets (USFWS BBF Survey guidelines 1989). There were no prairie dog towns observed within the project area. Therefore, due to lack of suitable habitat, there will be no effect to the black-footed ferret population through implementation of the proposed action.

Banner-tailed kangaroo rats are nocturnal animals that inhabit grasslands with scattered shrubs on heavier soils. Heavier soils are typically clay and silt soils, which have smaller particles and less porous and more moisture retentive. The burrow system is distinctive with 3-12 burrow openings on a raised mound. The project area does not have well developed grassland vegetation, which provides seed heads, the main food source. No banner-tailed kangaroo rats or burrows were observed during field surveys. Therefore, due to lack of suitable habitat, there will be no effect to the banner tailed kangaroo rat population through the implementation of the proposed actions.

The **kit fox** is a nocturnal animal that inhabits desert scrub or desert grassland with soft, alluvial or silty-clay soils, for excavating dens. The dens consist of 2-25 key-hole-shaped entrances and are commonly modified prairie dog, kangaroo rat, or badger burrows. Kit foxes are known to occur east of the Chuska Mountains and Chinle Valley in Arizona and Utah. No Kit foxes or dens were observed during field surveys. Therefore, due to lack of suitable habitat, there will be no effect to the kit fox population through implementation of the proposed actions.

The **bald eagle** is known to roost and nest in large trees along rivers, lakes, or reservoirs. The foraging habitat is typically associated with large water bodies, such as rivers, streams, and large reservoirs in close proximity to forested areas for roosting, perching, and nesting. No suitable habitat exists within the project area and no bald eagles were observed during the field visits. The bald eagles could use the San Juan River as foraging habitat, but the lack of steep cliffs and large trees along the reach segment would likely preclude extensive use. Therefore, due to lack of habitat there will be no effect to the bald eagle through implementation of the proposed actions.

The **golden eagle** primarily inhabits hilly or mountainous terrain and hunts over open country for birds, snakes, carrion, and small mammals. Golden eagles nest in trees 10 ft to 100 ft above ground or on rocky cliffs. There was no cliff substrate with trees within or near the project area. No golden eagles or nests were observed during field surveys. Therefore, due to lack of suitable habitat there will be no effect to the golden eagle population through implementation of the proposed action.

Ferruginous hawks generally inhabit dry, open country, badlands, and plains. The large stick nests are usually built in trees, on hillsides, buttes, cliffs, or rocky pinnacles. No ferruginous hawks, or nests were observed during field surveys. There were no badland pinnacles or cliffs/hillsides with trees within the project area. On the Navajo Nation, the majority (>90%) breed and winter in northwestern New Mexico, and also occur in Chinle

Valley and the Dilkon area (NNHP 2008). Therefore, due to lack of suitable habitat there will be no effect to the ferruginous hawk population through implementation of the proposed actions.

The **peregrine falcon** breeding territories are on cliffs, with large “gulfs” of air nearby in which these predators can forage. Water is often in close proximity. The nest sites are typically ledges or potholes, with the 3-4 eggs being laid directly on the bare substrate. No peregrine falcons or nests were observed during field surveys. There were no cliffs located within or near the project area. Therefore, due to lack of suitable habitat there will be no effect to the peregrine falcon population through implementation of the proposed actions.

The **western burrowing owl** inhabits arid open grasslands and desertscrub. They typically nest in ground burrows of abandoned prairie dog burrows. They may potentially occur at low elevation desertland up to juniper woodland communities throughout the Navajo Nation. No western burrowing owls were observed and no ground burrows or abandoned prairie dog towns were located within the project area. Therefore, due to lack of suitable habitat there will be no effect to the northern saw-whet owl through implementation of the proposed actions.

The **mountain plover** utilizes short-grass prairies (e.g., Plains-Mesa Grassland) and dry playas dominated by blue grama and buffalo grass. Mountain plovers nest on sites dominated by bare ground and short vegetation. This species breeds at moderate elevations (3,000-8,000 ft) on mesas and open plains. Mountain plovers are active from dawn until dusk. The only known breeding population on the Navajo Nation occurs in New Mexico. Plains-Mesa Grassland is not represented within the project area. No mountain plovers or their nests were observed during field surveys. Therefore, due to lack of suitable habitat there will be no effect to the mountain plover through implementation of the proposed project activities.

The **southwestern willow flycatcher** is a neo-tropical migrant associated with dense riparian shrub habitats for nesting and foraging. Surface water or saturated soils are almost always associated with occupied habitats during the breeding season. The nearest designated critical habitat (i.e., Rio Grande – Middle Complex) is located approximately 144 miles southeast of the proposed project area. The project area did not have dense riparian shrub habitat. The areas north of the proposed project area along the San Juan River reach segment had small patches of salt cedar and Russian olive, not dense riparian shrub habitat. Therefore, due to lack of suitable habitat there will be no effect to the southwestern willow flycatcher through implementation of the proposed actions.

The **yellow-billed cuckoo** is a neo-tropical migrant associated with open riparian woodlands and broad-leaf forests. The project area did not have riparian woodland or broad leaf forest habitat types. Therefore, due to lack of suitable habitat there will be no effect to the yellow-billed cuckoo through implementation of the proposed actions.

The **belted kingfisher** typically breeds near large bodies of water (e.g., rivers, streams, ponds) with large populations of fish, the main food source. Their nests are holes excavated in dirt banks. They use trees or wires to perch and catch fish by diving head-first often after hovering above the water. On the Navajo Nation, belted kingfishers are known to occur along the Tsaile and Asaayi Creeks in the Chuska Mountains, Morgan Lake, and along the Little Colorado River. There was no water bodies or perch trees located within the project area. The San Juan River is located north of the proposed project area and will not be affected by the proposed actions. Therefore, due to lack of suitable habitat there will be no effect to the belted kingfisher population through implementation of the proposed actions.

The **yellow warbler** is a neo-tropical migrant that is associated with riparian habitats, especially those dominated by willows (*Salix* spp.). This species is known to nest in willow, alder (*Alnus* spp.), and elderberry (*Sambucus* spp.) trees along riparian areas. There is no suitable riparian habitat for this species in or near the project area. Therefore, due to lack of suitable habitat there will be no effect to the yellow warbler through implementation of the proposed actions.

The **northern leopard frog** breeds in wetlands with perennial water bodies and aquatic vegetation, such as irrigation ditches, rivers, and small ponds. There were no wetlands or aquatic vegetation present within or near the project area, thus there is no suitable habitat for this species. Therefore, due to lack of suitable habitat there will be no effect to the northern leopard frog through implementation of the proposed project activities.

The **bluehead suckers** typically inhabit fast moving water areas in mountain streams and use small tributaries adjacent to large rivers as nursery areas. On the Navajo Nation, bluehead suckers are known to occur throughout the San Juan River and its major tributaries, in the Little Colorado River at the confluence with the Colorado River, and in several drainages in the western Chuska Mountains (i.e., Kinlichee, Whiskey Creeks). There was no surface water or water bodies within the project area and the San Juan River is north of the proposed project area. Therefore, due to lack of suitable habitat there will be no effect to the bluehead suckers through implementation of the proposed actions. In addition, silt fences, straw bales, or water turnouts would be installed to divert potential sedimentation from the sand and gravel pit into the San Juan River (see Cumulative Impact Section).

The **mottled sculpin** inhabits stream sections with coarse gravel and large to small rock substrates. Young typically inhabit areas with slow to no current, and use shorelines as cover from predators. Spawning occurs in shallow, scooped out depressions under large rocks where eggs are attached. This fish species is only known to occur from the New Mexico reach of the San Juan River on the Navajo Nation. There was no surface water or water bodies within the project area and the San Juan River is north of the proposed project area. Therefore, due to lack of suitable habitat there will be no effect to the mottled sculpin through implementation of the proposed actions. In addition, silt fences, straw bales, or water turnouts would be installed to divert potential sedimentation from the sand and gravel pit into the San Juan River (see Cumulative Impact Section).

The **roundtail chub** inhabits perennial water bodies in cool to warm mid-elevation streams, using pools and eddies adjacent to rapids and boulders. Juveniles use the margins of flowing water and backwater areas. Spawning typically occurs in runs and pools over gravel bottoms with ≥ 25 cm water depth. There was no surface water or water bodies within the project area and the San Juan River is north of the proposed project area. Therefore, due to lack of suitable habitat there will be no effect to the roundtail chub population through implementation of the proposed actions. In addition, silt fences, straw bales, or water turnouts would be installed to divert potential sedimentation from the sand and gravel pit into the San Juan River (see Cumulative Impact Section).

The **Colorado pikeminnow** generally inhabit large rivers with warm, swift, turbid waters. Backwater and flooded riparian areas are used during spring runoff and riffle areas with cobble substrate are used for spawning. Backwater and side channels with no current flow are used by larval and first year fish. The fish species is known to occur in the San Juan River from Shiprock to Lake Powell. The majority of adults have been observed approximately 7 miles downstream of Shiprock to downstream of the Four Corners area. There was no surface water or water bodies within the project area and the San Juan River is north of the proposed project area. Although the proposed project area is adjacent to designated critical habitat, the project area does not contain any of the primary physical and biological attributes necessary for the species viability (i.e., constituent elements). Therefore, due to lack of suitable habitat there will be no effect to the Colorado pikeminnow population through implementation of the proposed actions. In addition, silt fences, straw bales, or water turnouts would be installed to divert potential sedimentation from the sand and gravel pit into the San Juan River (see Cumulative Impact Section).

The **razorback suckers** generally inhabit large rivers with warm, swift, turbid waters, and backwater area. Spawning occurs in shallow, fast flowing riffle areas with cobble substrate. Backwater and side channels with no current flow are used by larval and first year fish. This fish species is known to occur in the Sand Juan River from Farmington to Lake Powell. The majority of adults have been observed in the Green River and lower Yampa River. Razorback suckers are rare in the Colorado River in Marble Canyon and the mouth of the Little Colorado River, the San Juan arm of Lake Powell, and upstream within San Juan River. The only known San Juan River record was in Bluff, Utah. The San Juan River is located north of the proposed project area and the irrigation canals are located south and north of the proposed project area. Although the proposed project area is adjacent to designated critical habitat, the project area does not contain any of the primary physical and biological attributes necessary for the species viability (i.e., constituent elements). Therefore, due to lack of suitable habitat, there will be no effect to the razorback sucker through implementation of the proposed actions. In addition, silt fences, straw bales, or water turnouts would be installed to divert potential sedimentation form the sand and gravel pit into the San Juan River (see Cumulative Impact Section).

Mancos milk-vetch is an herbaceous perennial found in cracks and eroded depressions along sandstone rimrock ledges and mesa tops derived from Point Lookout and

Cliffhouse sandstone formations at elevations of 5,000-6,000 feet (NNHP 2008). Plants are known to occur in San Juan County, New Mexico on the Navajo Nation from Palmer Mesa east to the Hogback area and south of the San Juan River to Hogback east of Little Water. The proposed project area is not derived from Point Lookout sandstone or Cliffhouse sandstone and did not have rimrock ledges or mesa tops. Therefore due to lack of suitable habitat, there will be no effect to the Mancos milk-vetch through implementation of the proposed actions.

The **Mesa Verde cactus** is a succulent found in salt-desert scrub communities on sparsely vegetated, clay hills or benches typically derived from Mancos or Fruitland shale formations at elevations ranging from 4,900-5,500 feet. Mesa Verde cacti are known to occur at the Colorado border south to near Naschitti, New Mexico (NNHP 2008). The project area is derived from the Mancos shale formation, but did not include barren, clay hills or benches. No suitable habitat for the Mesa Verde cacti was observed during field surveys. Therefore, due to no suitable habitat, there will be no effect to the Mesa Verde Cacti population through the implementation of the proposed project action.

The **San Juan milkweed** is an herbaceous perennial found in sandy loamy soils on disturbed sites in pinyon-juniper woodlands or Great Basin grasslands at elevations of 5,000-5,500 feet (NNHP 2008). The San Juan milkweed is known to occur east of State Highway 491, south of the San Juan River, and north of the San Juan County line. No San Juan milkweed was observed during the field surveys. Pinyon-juniper woodlands and Great Basin desert grassland plants communities are not present within the proposed project area. Therefore, due to no suitable habitat, there will be no effect to the San Juan milkweed population through the implementation of the proposed project actions.

The **naturita milkweed** is an herbaceous perennial found in sand-filled pockets of sandstone slickrock and rimrock pavement along canyons in pinyon-juniper woodlands at elevations ranging from 5,000-7,000 feet. The naturita milk-vetch is known to occur in Hogback, San Juan County, New Mexico. There were no canyons with pinyon-juniper woodlands located within the proposed project area. Therefore due to lack of suitable habitat, there will be no effect to the naturita milk-vetch through the implementation of the proposed actions.

Wildlife observed at the project area included common ravens (*Corvus corax*), white-crowned sparrows (*Zonotrichia leucophrys*), horned larks (*Eremophila alpestris*), and American coots (*Fulica Americana*).

4.0 CUMMULATIVE IMPACTS

The proposed action will result in temporary and/or minor impacts to wildlife due an increase in noise and dust. Local residents will be temporarily affected through increases in noise, traffic, and dust. The sand and gravel operation would benefit the chapter and community by providing materials for future road improvements on the Navajo Nation.

Foreseeable effects of the proposed action will be temporarily increase in noise and suspended dust during the construction. A buffer zone of 60 meters between the San Juan River and the proposed project area would be implemented to prevent impacts to the designated critical habitat for the Colorado pikeminnow and the razorback sucker (NNHP 2008). In addition, the following best management practices will be incorporated into the project design plans to the fullest extent possible:

- Construction equipment will be inspected daily for leaks. Leaking equipment will be removed fro the project site until repaired and spills are cleaned.
- Equipment will be refueled at least 100 feet from the San Juan River and all fuels, oils, lubricants, and hydraulic fluids will be kept in sealed, storage containers or facilities that are located within the construction area.
- Parking and staging areas will be located within the boundaries of the construction area.
- Existing roads will be used for detours, storage of equipment and hauling of materials and water to the fullest extend possible.
- Still fences, straw bales, or water turnouts should be installed to serve as sediment diversions.
- All construction equipment will be cleaned before the start and end of each day to prevent noxious weeds dispersal and inspected daily for leaks. Leaking equipment will be removed from the project site until repaired and cleaned.

The 1987 amendments to Section 402(p) of the Clean Water Act (CWA) clarifies that storm water discharges associated with industrial activity to waters of the United States must be authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Industrial activity includes storm water discharge associated with construction activities that involve clearing, grading, and excavation that result in the disturbance of more than or equal to one acre of total land area. Because the construction activities in the proposed action will disturb approximately 105 acres (ac) (42 hectares (ha)) of land, section 402(p) of the CWA requires the contractor to file with the Navajo Nation Environmental Protection Agency a “Notice of Intent” and comply with the terms of this permit. The construction contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) and obtain the necessary permits before work commences.

There will be no impacts to any “Waters of the U.S.” from the proposed action. Therefore, neither a Clean Water Act Section 401, Water Quality Certification, nor Clean Water Act Section 404 permit will be required.

The project area is located within the 100-year floodplain as delineated by the Navajo Nation Water Resources Water Management Branch.

The proposed action will not affect the volume of surface or groundwater in the project area. Water will be required for construction activities. Although this water may be obtained from trust land, it is unknown at this time as to where the water will be obtained. Permits to use water will be obtained from the appropriate agencies or persons as required. If water is obtained from the Navajo Nation, then the construction contractor will obtain a permit for the Department of Water Resource Management at least thirty days prior to construction. The contractor will notify the Navajo Nation of the location of water resources to be used during construction.

5.0 LIST OF PREPARERS

Stephanie Lee, Biologist, Ecosystem Management, Inc.

6.0 CONCLUSION

The proposed action will result in temporary and/or minor impact to vegetation, wildlife, and soils. Wildlife habitat may suffer short-term degradation due to loss of vegetation, which may provide forage and cover. No major or long-term effects on wildlife are anticipated. Incidental mortality or displacement among animals may occur on the site during clearing and preparation of the site. However, the plant community is widespread and those animals are expected to move into adjacent habitats.

A buffer approximately 60 meters would be implemented to prevent changes to the designated critical habitat for the razorback sucker and the Colorado pikeminnow.

The shrubs located around the road and within the construction area should be checked for nesting birds before construction commences if during breeding season, March to July. All birds and their parts (including feathers, eggs, nests), except house sparrows (*Passer domesticus*), European starlings (*Sturnus vulgaris*), and rock doves (*Columba livia*) are fully protected under the Migratory Bird Treaty Act. If construction is to take place during the breeding season, it is recommended a biologist conduct a nest survey before work commences. If active nests are observed during construction, then a biologist will be contacted in order to remove the nests. The biologist will obtain a Migratory Bird Treaty Act Permit prior to removal.

7.0 REFERENCE CITED

- Dick-Peddie, W.A. 1993. New Mexico Vegetation: Past, Present, and Future. UNM Press, Albuquerque, New Mexico, USA.
- Navajo Nation Natural Heritage Program [NNHP]. 2008. Species Accounts. http://nnhp.nnfw.org/a_comname.htm. Accessed 18 November 2008.
- _____. 2008. Species Accounts: Colorado Pikeminnow. http://nnhp.nnfw.org/a_comname.htm. Accessed 6 April 2009.
- US Department of Agriculture Natural Resources Conservation Service [USDA NRCS]. J. V. Chiaretti, Jr. 2001. Survey of Shiprock Area, parts of San Juan County, New Mexico and Apache County, Arizona. United States Department of Agriculture, Natural Resources Conservation Services, Washington D.C., USA. <http://www.websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed 18 November 2008.

CERTIFICATION

It is believed by Ecosystem Management, Inc. that the proposed action would not violate any of the provisions of the Endangered Species Act of 1973, as amended, or Navajo Nation code requirements for endangered species (17NNC507). Conclusions of this report are based on actual field examination and are correct to the best of my knowledge. I certify that I have conducted field surveys for the proposed **Biological Evaluation for proposed 105 acre sand and gravel operation in Hogback, San Juan County, New Mexico.**



Stephanie Lee, M.S. Wildlife and Fisheries Sciences
Title: Biologist
Ecosystem Management, Inc.

APPENDIX A: Photographs of the Project Area



Photo 1. East view of proposed project area.



Photo 2. Southeast view of proposed project area.



Photo 3. West view of proposed project area.



Photo 4. Northeast view of proposed project area.



Photo 5. North view of Russian olive and tamarisk patch adjacent to proposed project area.



Photo 6. Southeast view of the San Juan River adjacent to the proposed project area.

APPENDIX B: Navajo Fish and Wildlife Data Request and Response Letters

BE for Proposed Sand and Gravel Operation

Ecosystem Management Inc



THE
NAVAJO
NATION

JOE **SHIRLEY**, JR.
PRESIDENT
Ben **Shelly**
VICE PRESIDENT

Dept of Fish & Wildlife • P.O. Box 1480 • Window Rock, AZ 86515 • (928) 871-6451 • Fax (928) 871-706

05 October 2007

File#07DIN102

Donald Benally, President
Dibe Niista, LLC
P.O. Box 3393
Shiprock, NM 87420

SUBJECT: PROPOSED SAND & GRAVEL OPERATION
LOCATED IN LEGAL DESCRIPTION
T29N, R17W, SEC. 12 & T29N, R16W, SEC. 7
HOGBACK, SAN JUAN COUNTY, NM

Mr. Benally:

The following information on species of concern¹ is provided in response to your 18 September 2007 request concerning the subject project, which consists of the proposed 105-acre Sand & Gravel Operation is located in legal descriptions T29N, R17W, Section 12 and T29N, R16W, Section 7, Hogback, San Juan County, NM.

Known to occur within three miles of the project site:

1. *Empidonax traillii extimus* (Southwestern Willow Flycatcher); NESL group 2; ESA endangered, MBTA
2. *Astragalus humiflorus* (Manaos Milk-vetch); NESL group 2, ESA endangered.
3. *Sclerocactus mesae verdae* (Mesa Verde Cactus); NESL group 2; FSSA threatened.

Each 7.5 minute quadrangle containing project boundaries is addressed separately below. For potentially occurring species these species lists are quadrangle-specific rather than project specific. Potential for species has been determined primarily on quadrangle-wide coarse habitat characteristics and species range information. Your project biologist should determine habitat suitability at the project site(s).

A total of twenty (20) species both known and/or potential are included in this response. They are:

1. *Accipiter chrysaetos* (Golden Eagle); NESL group 3; MBTA; EPA
2. *Arhene cucularia hypugea* (Western Burrowing Owl); MBTA
3. *Buteo regalis* (Ferruginous Hawk); NESL group 3; MBTA
4. *Catostomus discobolus* (Bluehead Sucker); NESL group 4

¹"Species of concern" include protected, candidate, and other rare or otherwise sensitive species, including certain native species and species of economic or cultural significance. For each species, the following tribal and federal statuses are indicated: Navajo Endangered Species List (NESL), federal Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Eagle Protection Act (EPA). No legal protection is afforded species with only ESA candidate or NESL group 4 status; please be aware of these species during surveys and inform the NFWD of observations. Documentation that these species are more numerous or widespread than currently known, and addressing these species in project planning and management is important for conservation and may contribute to ensuring they will not be uplisted in the future. Species without ESA or NESL legal protection (e.g., NESL group 4 species) are only included in responses on a regular basis and may not be included in this response. Please refer to the NESL for a list of group 4 species, contact me if you need a copy.

5. Ceryle alcyon (Belred Kingfisher); NESL group 4; MBTA.
6. Charadrius montanus (Mountain Plover); NESL group 4; ESA proposed threatened; MBTA.
7. Coccyzus americanus (Yellow-billed Cuckoo); NESL group 3; MBTA. ESA Candidate
8. Cottus bairdi (Mottled Sculpin); NESL group 4
9. Dendroica petechia (Yellow Warbler); NESL group 4, MBTA.
10. Dipodomys spectabilis (banner tailed kangaroo rat); NESL Group 4.
11. Falco peregrinus (Peregrine Falcon); NESL group 4; MBTA.
12. Gila robusta (Roundtail Chub); NESL group 2.
13. Haliaeetus leucocephalus (Bald Eagle); ESA threatened, MBTA; EPA.
14. Mustela nigripes (Black-footed Ferret); NESL group 2; ESA endangered.
15. Ptychocheilus lucius (Colorado Pikeminnow), NESL group 2; ESA threatened.
16. Rana pipiens (Northern Leopard Frog), NESL group 2.
17. Vulpes macrotis (Kit Fox), NESL group 4.
18. Xyrauchen texanus (Razorback Sucker), NESL group 2, ESA endangered.
19. Astragalus naturitensis (Naturita Milk vetch); NESL group 4.
20. Asclepias sanjuanensis (San Juan Milkweed); NESL group 4.

Potential for the black-footed ferret should be evaluated if prairie-dog towns of sufficient size (per NFWF guidelines) occur in the project area.

Potential for Puccinellia parishii should be evaluated if wetland conditions exist that contain white alkaline crusts.

Biological surveys need to be conducted during the appropriate season to ensure they are complete and accurate please refer to NN Species Accounts.⁴ Further questions pertaining to surveys should be referred to Species Account. Surveyors on the Navajo Nation must be permitted by the Director, NFWF. Contact Jeff Cole at (928) 871-7068 for permitting procedures. Questions pertaining to surveys should be directed to the NFWF Zoologist (David Mikesic) for animals at 871-7070, and Botanist (Daniela Roth) for plants at (928) 523-8445. Questions regarding biological evaluation should be directed to Jeff Cole (Acting Environmental Reviewer) at 871-7060.

On 21 March 1994 (Federal Register, Vol. 59, No. 54), the U.S. Fish and Wildlife Service designated portions of the San Juan River (SJR) as critical habitat for Ptychocheilus lucius (Colorado squawfish) and Xyrauchen texanus (Razorback sucker). Colorado squawfish critical habitat includes the SJR and its 100-year floodplain from the State Route 371 Bridge in T29N, R13W, sec. 17 (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian) up to the full pool elevation. Razorback sucker critical habitat includes the SJR and its 100-year floodplain from the Hogback Diversion in T29N, R16W, sec. 9 (New Mexico Meridian) to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T41S, R11E, sec. 26 (Salt Lake Meridian). All actions carried out, funded or authorized by a federal agency which may alter the constituent elements of critical habitat must undergo section 7 consultation under the Endangered Species Act of 1973, as amended. Constituent elements are those physical and biological attributes essential to a species conservation and include but are not limited to, water, physical habitat, and biological environment as required for each particular life stage of a species.

Also of concern are impacts to any wetland or riparian habitats and their associated species, such as those

⁴ Available free of charge on our website at <http://nnhp.navajofishandwildlife.org>

of San Juan County, NM.

Potential impacts to wetlands should also be evaluated. The U.S. Fish & Wildlife Service's National Wetlands Inventory (NWI) maps should be examined to determine whether areas classified as wetlands are located close enough to the project site(s) to be impacted. In cases where the maps are inconclusive (e.g., due to their small scale), field surveys must be completed. For field surveys, wetlands identification and delineation methodology contained in the 'Corps of Engineers Wetlands Delineation Manual' (Technical Report Y 87-1) should be used. When wetlands are present, potential impacts must be addressed in an environmental assessment and the Army Corps of Engineers, Phoenix office, must be contacted. NWI maps are available for examination at the NFWD's Natural Heritage Program (NHP) office, or may be purchased through the U.S. Geological Survey (order forms are available through the NHP). The NHP has complete coverage of the Navajo Nation, excluding Utah, at 1:100,000 scale, and coverage at 1:24,000 scale in the southwestern portion of the Navajo Nation.

The information in this report was identified by the NFWD's biologists and computerized database, and is based on data available at the time of this response. If project planning takes more than two (02) years from the date of this response, verification of the information provided herein is strongly recommended. It should not be regarded as the final statement on the occurrence of any species, nor should it substitute for on-site surveys. Also, because the NFWD's information is continually updated, any given information response is only wholly appropriate for its respective request.

For a list of sensitive species on the Navajo Nation in addition to the species listed on the Navajo Endangered Species List (NESL) please refer to our website at www.navajofishandwildlife.org.

An invoice for this information is attached.

If you have any questions I may be reached at (928) 871-6472.



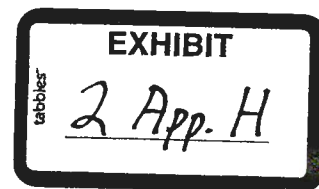
Sonja Petsof, Wildlife Tech.
Natural Heritage Program
Department of Fish and Wildlife

xc. file chrono

Appendix H Navajo Nation Solid Waste Management Program and Regulation

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"



Appendix H Cultural Resources Survey

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"

CULTURAL RESOURCES COMPLIANCE FORM

THE NAVAJO NATION
HISTORIC PRESERVATION DEPARTMENT
PO BOX 4950
WINDOW ROCK, ARIZONA 86515

ROUTING COPIES TO
NM SHPO
XX REAL PROPERTY MGT/330
HAS

NNHPD NO HPD-07-1001
OTHER PROJECT NO.

HAS 034

PROJECT TITLE: Cultural Resource Survey of 105.67 Acres for Proposed Mining Operations on the San Juan Chapter of the Navajo Nation, San Juan County, New Mexico

LEAD AGENCY: BIA/NR

SPONSOR: Navajo Nation Economic Development, Shiprock Regional Business Development Office, PO Box 1864, Shiprock, New Mexico 87420

PROJECT DESCRIPTION: The proposed undertaking will involve a proposed sand & gravel mining operations to be conducted by Dibe Nista Sand & Gravel. Mining operations include extraction of sand & gravel & the installation of a small office. Ground disturbance will be intensive and extensive with the use of heavy equipment.

LAND STATUS: Tribal Trust

CHAPTER: San Juan

LOCATION: T29N, R16W Sec. 1 Hogback North Quadrangle, San Juan County New Mexico

PROJECT ARCHAEOLOGIST: Richard Burleson

NAVAJO ANTIQUITIES PERMIT NO.: B07446

DATE INSPECTED: 08/23/07

DATE OF REPORT: 08/23/07

TOTAL ACREAGE INSPECTED: 105.67 ac

METHOD OF INVESTIGATION: Class III pedestrian inventory with transects spaced 15 m apart.

LIST OF CULTURAL RESOURCES FOUND: (3) Sites (NM-H-20-140, NM-H-20-141, NM-H-20-142) & (7) Isolated Occurrences (IO 1-7)

LIST OF ELIGIBLE PROPERTIES: (3) Sites (NM-H-20-140, NM-H-20-141, NM-H-20-142)

LIST OF NON-ELIGIBLE PROPERTIES: (7) IO

LIST OF ARCHAEOLOGICAL RESOURCES: (3) Sites (NM-H-20-140, NM-H-20-141, NM-H-20-142)

EFFECTIVE DATES OF COMPLIANCE: No Historic Properties were identified provided that the following conditions are met:

Sites NM-H-20-140, NM-H-20-141 & NM-H-20-142:

1. Prior to ground any disturbing activities, the site boundaries will be flagged by a qualified archaeologist.

2. Sites will be avoided by fencing the site boundaries.

3. Sites will be monitored by a qualified archaeologist during fencing and during all ground disturbing activities within 50 ft of the site boundaries.

4. A letter/report documenting the results of the monitoring at the sites will be submitted to NNHPD within 30 days of the monitoring.

In the event of discovery ("discovery" means the discovery of previously unidentified or incorrectly identified cultural resources including, but not limited to, archaeological deposits, human remains, or locations reportedly associated with Native American religious/traditional practices), all persons in the immediate vicinity of the discovery must notify the Navajo Nation Historic Preservation Department at (928) 714-7148.

FORM PREPARED BY: Billie

FINALIZED: August 2007

Is this work

Exceeds Recommendation

Conduct

Yes ☒ No ☐

Y ☒ N ☐

Alan S. L...
Navajo Nation
Historic Preservation Officer

Date

11/24/07

Regional Approver

Y ☒ No ☐

Acting Regional Director

HPD-07-1001

ARCHAEOLOGICAL INVENTORY REPORT DOCUMENTATION PAGE (HPD JAN/91)

1. HPD REPORT NO.	2. HPD USE ONLY	3. RECIPIENTS ACCESSION NO.
4. TITLE OF REPORT: Cultural Resource Survey of 105.67 acres for Proposed Mining Operations on the San Juan Chapter of the Navajo Nation, San Juan County, New Mexico.		5. FIELDWORK DATES Start: 08/23/2007 End: 08/23/2007
Author(s) Richard Burleson		6. REPORT DATE 08/24/2007
7. CONSULTANT NAME AND ADDRESS: Individual Responsible: Richard Burleson Organization Name: Hammerstone Archaeological Services Organization Street: 7016 Tampico Road, NE Organization City: Rio Rancho, NM 87144 Telephone: 505-771-2257		8. PERMIT NO. B07446
		9. CONSULTANT REPORT NO. 034
10. SPONSOR NAME AND ADDRESS: Individual Responsible: Randolph Sells Organization Name: Division of Economic Development, Shiprock Regional Business Development Office Organization Street: PO Box 1864 Organization City: Shiprock, NM 87420 Telephone: 505-368-1315		11. SPONSOR PROJECT NO.
		12. AREA OF EFFECT: 105.67 ac AREA SURVEYED: 105.67 ac
13. LOCATION a. Chapter: San Juan b. Agency: Shiprock c. County: San Juan d. State: New Mexico		e. Land Status: Tribal Trust f. UTM (Zone 12) Center Point 716748 E, 4068845 N g. Area: T 29N, R 16W, Sec. 7; and T 29N, R 17W, Sec. 12 h. 7.5' Map Name(s): The Hogback North, NM

14. REPORT ☒**OR SUMMARY REPORT ☐****OR PRELIMINARY REPORT ☐**

a. Description of Undertaking: The 105.67 acres are scheduled for proposed gravel mining operations. This specific project is to complete a Class III cultural resources inventory as part of the Section 106 compliance process in support of the proposed construction project. Local residents were interviewed regarding the presence of religious, ceremonial, burials, and/or culturally sensitive areas on the project area, or the immediate environs. On August 23, 2007, Richard Burleson, supervisory archaeologist, spoke with three local residents, Frank Sands, Miranda Sands, and James Yazzie. No traditional cultural properties were identified during the ethnographic inquiries. Miranda Sands did indicate knowledge of Anasazi ceramics within the project area.

b. Existing Data Review: 08/06/2007 –Two previously recorded archaeological sites (LA 8398 and 8399) are within 100 meters of the project area. Both sites are Anasazi Pueblo III period habitation sites. These sites were never assigned a Navajo Nation site number.

c. Area Environmental & Cultural Setting: The project area is in the Navajo Section of the Colorado Plateau Province of the North American continent. Specifically, the project area is situated immediately south of the San Juan River, just west of the Hogback formation that bisects US Highway 64, between Shiprock and Fruitland. This project area is situated on the bluffs overlooking the river. The Colorado Plateau is characterized by canyons, high altitude, steep escarpments, flat plateaus comprised of gently dipping sedimentary rocks, and an arid climate. Surfaces in the Navajo Section are mesas, buttes, and cuevas with some clinal ridges and hogbacks. A full range of prehistoric cultural materials are present within the project area and include Paleoindian, Archaic, Anasazi, and Historic (primarily early Anglo, Hispanic, and later Reservation Era Navajo occupations). The vast majority of the prehistoric cultural materials present within the project area would relate to the Pueblo III Period of the Anasazi occupation dating to A.D. 1200-1300 characterized by above-ground masonry roomblocks, and kivas with Black-on-white pottery (McElmo and Mesa Verde) dominating the artifact assemblages. The vast majority of the historic archaeological materials present within the project area are Reservation Era Navajo materials that are characterized by various types of hogans, and features such as corrals indicative of pastoral pursuits.

d. Field Methods: A 100 percent pedestrian survey (Class III) of the project areas was conducted. Non-overlapping transects spaced at no greater than 10 m (33 ft) were used to traverse the entire 105.67 acres. Cultural resources were to be recorded as a site using the following criteria: (1) ten or more artifacts of two or more artifact classes or types within a 400 m² area; or, (2) the presence of a structure, feature, or midden. Resources not meeting these criteria, in a severely disturbed, highly mobile context were recorded as isolated occurrences (IOs). Previously recorded sites were updated on Navajo Nation site forms and given Nation site numbers

15. CULTURAL RESOURCE FINDINGS:

Location/Identification of Each Resource: Three previously recorded cultural resource sites and seven isolated occurrences were identified. NM-H-20-140 (LA 5740) is located at UTM: Zone 12; 717087 E, 4068840 N. NM-H-20-141 (LA 8398) is located at UTM: Zone 12; 716858 E, 4069015 N. NM-H-20-142 (LA 8399) is located at UTM: Zone 12; 716913 E, 4068974 N. Please see the Isolated Occurrences Table in the report for complete descriptions and locations.

Evaluation of Significance of Each Resource (above): Site NM-H-20-140 (LA 5740) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-20-141 (LA 8398) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-20-142 (LA 8399) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. The isolated occurrences identified are not likely to yield significant data towards our present understanding of the prehistoric or historic periods of the region. Therefore, the isolates do not require any further investigation.

16. MANAGEMENT SUMMARY (RECOMMENDATIONS): Three previously recorded archaeological sites and seven isolated occurrences were discovered within the proposed project area. These three cultural resource properties will be affected by the proposed project undertaking. They are located along the extreme southern edges of the bluff overlooking the south banks of the San Juan River and therefore can be avoided by the proposed project undertaking. It is recommended that protective fencing be placed around the site boundaries to prevent any inadvertent trespass or vehicular/mechanical disturbance. The seven isolated occurrences identified are not

17. CERTIFICATION:

Signature Date 8/24/2007

General Charge Name: Richard Burleson

Signature Date 8/24/2007

Direct Charge Name: Richard Burleson

*HAMMERSTONE
ARCHAEOLOGICAL
SERVICES*

*CULTURAL RESOURCE
SURVEY*

*Of 105.67 Acres for Proposed
Mining Operations on the*

San Juan Chapter of the Navajo

Nation,

San Juan County, New Mexico

Prepared By

Hammerstone Archaeological

Services

7016 Tampico Road, NE

Rio Rancho, New Mexico 87144

Prepared For
Navajo Nation
Division of Economic Development
Shiprock Regional Business
Development Office

August 2007

Cultural Resource Survey

**Of 105.67 Acres for Proposed Mining Operations on the San Juan Chapter
of the Navajo Nation, San Juan County, New Mexico**

**Prepared by
Richard Burleson**

**Under
Navajo Nation Cultural Resources Inventory Permit Number B07446
BIA Permit Number 2007-046**

**Organization
Hammerstone Archaeological Services
7016 Tampico Road, NE
Rio Ranch, New Mexico 87144
(505)771-2257
FAX (505) 771-1084**

**Prepared for:
Navajo Nation
Division of Economic Development
Shiprock Regional Development Office
Shiprock, New Mexico**

**Submitted to:

Navajo Nation Historic Preservation Department
P.O. Box 4950
Window Rock, AZ 86515**

HAS Project/Report Number 034

August 2007

ABSTRACT

On August 23, 2007, Hammerstone Archaeological Services (HAS) conducted a Class III cultural resources survey of 105.67 acres located on the San Juan Chapter of the Navajo Nation, San Juan County, New Mexico for the Navajo Nation Division of Economic Development, Shiprock Regional Business Development Office. The project area is scheduled for proposed sand and gravel mining operations conducted by Dibe Niista Sand & Gravel. The mining operations will include extraction of sand and gravel for local and regional road construction, for use as concrete, miscellaneous construction projects, and sale to the local community. A small office will be located on the site; however most of the 105.67 acres that were surveyed will be mined. The equipment to be used is as follows: crusher, front-end loader, excavator, bulldozer, conveyor belts, and a concrete plant. Dibe Niista Sand & Gravel plan to mine the site for 25 years or more. The project lands include Navajo Nation Trust lands administered by the Navajo Nation. Work was performed under BIA permit number 2007-046, and the Navajo Nation Cultural Resource Inventory Permit Number B07446. Funding is being provided by the Navajo Nation.

Three previously recorded archaeological sites and seven isolated occurrences were discovered within the proposed project area and it has been determined that there will be no adverse effect by the proposed project undertaking. Site NM-H-20-140 (LA 5740) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-120-141 (LA 8398) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-120-142 (LA 8399) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. The seven isolated occurrences identified are not likely to yield significant data towards our present understanding of the prehistoric or historic periods of the region. Therefore, the isolates do not require any further investigation.

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INTRODUCTION

On August 23, 2007, Hammerstone Archaeological Services (HAS) conducted a Class III cultural resources survey of 105.67 acres located on the San Juan Chapter of the Navajo Nation, San Juan County, New Mexico for the Navajo Nation Division of Economic Development, Shiprock Regional Business Development Office. The project area is scheduled for proposed sand and gravel mining operations conducted by Dibe Niista Sand and Gravel. The mining operations will include the extraction of sand and gravel for local and regional road construction, for use as concrete, miscellaneous construction projects, and sale to local community. A small office will be located on the site; however most of the 105.67 acres that were surveyed will be mined. The equipment to be used is as follows: crusher, front-end loader, excavator, bulldozer, conveyor belts, and a concrete plant. Dibe Niista Sand and Gravel plan to mine the site for 25 years or more. The project lands include Navajo Nation Trust lands administered by the Navajo Nation. Work was performed under BIA permit number 2007-046, and the Navajo Nation Cultural Resource Inventory Permit Number B07446. Funding is being provided by the Navajo Nation.

Three previously recorded archaeological sites and seven isolated occurrences were discovered within the purposed project area and it has been determined that there will be no adverse effect by the proposed project undertaking. Site NM-H-20-140 (LA 5740) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-20-141 (LA 8398) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-20-142 (LA 8399) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. The seven isolated occurrences identified are not likely to yield significant data towards our present understanding of the prehistoric or historic periods of the region. Therefore, the isolates do not require and further investigation.

This undertaking complies with the provisions of the National Historic Preservation Act of 1966, as amended through 1992, the Archaeological Resource Protection Act of 1979 as amended, and the American Indian Religious Freedom Act of 1978, as amended through 1996. The report is consistent with applicable Navajo Nation, federal, and state standards for cultural resource management. Approximately 100 person hours (including travel time) were required to complete the field work. Field work was performed by Richard Burleson and Cheryl Burleson. Richard served as principal investigator.

PROJECT DESCRIPTION AND LOCATION

The project consists of a cultural resource Class III survey of 105.67 acres located on the San Juan Chapter of the Navajo Nation, on the south banks of the San Juan River between Shiprock and Fruitland, San Juan County, New Mexico. The 105.67 acres are scheduled for proposed gravel mining operations.

The project areas are on San Juan Chapter lands administered by the Navajo Nation. The project area is located on The Hogback North, NM USGS 7.5-minute quadrangle map. The legal location is Township 29 North, Range 16 West, Section 7 and Township 29 North, Range 17 West, Section 12. The project location is shown in Appendix A Map 1.

ENVIRONMENTAL SETTING

Physiography

The project area is located in northwestern New Mexico. This area is in the Navajo Section of the Colorado Plateau Province of the North American continent. Specifically, the project area is situated immediately south of the San Juan River, just west of the Hogback formation that bisects US Highway 64, between Shiprock and Fruitland. This project area is situated on the bluffs overlooking the river. The Colorado Plateau is characterized by deep canyons, high altitude, steep escarpments, flat plateaus comprised of gently dipping sedimentary rocks, and an arid climate (Thornbury 1965). The most distinctive structural feature of the province is its large number of monoclines. The monoclines are broken throughout the province by structural basins and upwarps of considerable relief. Volcanic structures are concentrated around the plateau's margin, but are also scattered throughout its interior (Kelly 1955).

The Navajo Section of the province is a poorly defined area of scarped plateaus that lack the degree of dissection that occurs elsewhere in the province (Thornbury 1965). Surfaces in the Navajo Section are mesas, buttes, and cuetsas rather than clinal ridges and hogbacks. The section is bounded on the west and south by the Little Colorado River and the Echo Cliffs monocline near the Colorado River. The northern boundary is along the lower San Juan River to the Four Corners area, then northeast to the San Juan Mountains. The southeast boundary extends from the Sierra Nacimiento to Mt. Taylor and onward to the Puerco River.

The Navajo Section has numerous volcanic features that include vents, flows, and pyroclastic deposits that are referred to collectively as the Navajo-Hopi Volcanic Field. Other major structural features of the section include the Black Mesa Basin, The Defiance Upwarp, and the San Juan Basin. The Navajo-Hopi Volcanic Field is comprised of the Hopi Buttes, Monument Valley, and the Chuska Mountains. Basalt-capped mesas and buttes are common throughout the section (Thornbury 1965).

The exposed rocks of the Colorado Plateau range from the Precambrian to the Recent Period in age (Thornbury 1965). Black Mesa is capped by the Cretaceous Mancos Shale and Mesa Verde Sandstone formations. The Defiance Upwarp has exposed the much older De Chelly Sandstone. The Navajo Section is characterized as a basin with thick layers of gently dipping Mesozoic and Cenozoic sedimentary shale, mudstone, and sandstone that contain coal seams. The area is generally characterized as rolling plains with cuestas and tablelands capped by sandstone. Canyons are typically broad and shallow (Williams 1986).

The character of the Colorado Plateau as we know it is a product of the interaction of three processes: uplift; volcanism, and erosion. Erosion is the primary force that has created the extant landscape. The tectonic event that uplifted the Colorado Plateau involved the westward movement of the North American plate, beginning about 75 million years ago. Over a period of the next 25 million years the western portion of the North American plate broke, buckled, and was uplifted, forming the Rocky Mountains. The following 45 million years has been degradation as material has been removed from the surface of the plateau to form the Middle and Late Tertiary deposit in other regions.

As part of the plate tectonics, weak spots formed in the North American plate that allowed volcanic pipes to form, and the Hopi Buttes volcanic field was created from 8 to 4 million years ago. Explosive eruptions ejected large quantities of tuff and basalt flows that spread outward from the vents. By the early Pleistocene, renewed uplift of the plateau had drained Hopi Lake and accelerated erosion from the province. The Colorado River was flowing through the Gulf of California by this time, with increased channel cutting. Elevation varies from about 1504 m (4900 ft) in southern San Juan County in Utah to 1672 m (5500 ft) at Tonalea, Arizona, to nearly 2310 m (7600 ft) on Black Mesa, Arizona.

The Colorado Plateau has eroded to a greater degree than any other part of the United States (Thornbury 1965). The De Chelly Sandstone and the Shinarump member of the Chinle Formation act as a single aquifer and numerous springs are found along these formations.

Vegetation observed during the survey included juniper, cholla, prickly pear, snakeweed, and grasses. Soils in the immediate area are shallow if present at all. Bedrock was exposed at the surface in places at several of the proposed homesites. In general, surface materials at the homesites consisted primarily of sandy loams, clayey sandy loams, and sandy loams with gravels and/or basalt clasts.

CULTURAL HISTORY OVERVIEW

Paleoindian (ca. 10,000 B.C. to 5500 B.C.)

The Paleoindian period is that it was characterized by relatively small bands of hunters relying on large, now extinct, Pleistocene megafauna. There is controversy concerning when Paleoindian peoples first arrived in North America, with progressively earlier dates from sites of this period appearing consistently. The earliest evidence in New Mexico conforms to the date range indicated above, although earlier sites will likely be found. Consistent with a seemingly primary focus on large game animals such as mammoth and bison, many of which were migratory Paleoindian sites are ephemeral, reflecting periodic movement of camps to areas where animals might be found. At the same time, there is some evidence of reliance on plant resources. The highest concentrations of Paleoindian sites have been found in two settings. The first setting is along the margins of playas, small ephemeral lakes that hold water for short periods during the rainy season (Judge 1973). The second setting is along ridge line paralleling large drainages where, again, water might be available. Sites are known from the Puerco Basin, the Chuska Valley along the Arizona-New Mexico border, and the Chaco Plateau (Vivian 1990). Most consist of isolated projectile points, again consistent with what seems to be a highly mobile lifestyle. Paleoindian sites consist primarily of chipped stone tools, including large bifacial projectile points. These points were attached to wooden shafts to form spears or large darts, thrown with an atlatl, or spear thrower. Variations in the ways these points were manufactured, specifically reliance on fluting and lateral thinning, have allowed archaeologists to separate the Paleoindian period into three time-sequent complexes. Nonfluted Clovis points typify the earliest complex. Later, fluted points suggest the appearance of the Folsom complex. Finally, points typified by extreme lateral thinning are indicative of the Plano complex. Rarely are bone and wooden tools preserved in the archaeological record. Evidence of Plano complex occupations is generally lacking for the region as a whole. Despite numerous archaeological surveys and excavations in the region, the scarcity of diagnostic artifacts and assemblages currently documented suggest a very limited use of the San Juan Basin during the Paleoindian period.

Archaic Period (ca. 5500 B.C. to A.D. 400)

The Archaic period is signaled by the extinction of earlier Pleistocene fauna, due to the combined effects of the drought, as well as hunting by Paleoindian peoples. Although hunting continued to be important throughout the Archaic period, there was greater reliance on gathering of plant resources. The appearance of new classes of artifacts, notably ground stone implements that were used to process plant foods for consumption are in conjunction with this shift in subsistence. Projectile points decrease in size consistent with hunting smaller game. Archaic hunting-and-gathering groups seem to have remained small in size, probably consisting of no more than a few extended families. Archaic sites are found throughout the San Juan Basin. Sites tend to alternate between semi-permanent (winter) base camps that were previously occupied from year to year and more ephemeral (summer) sites related to the completion of specific seasonal hunting or gathering activities. General trends in the number of Archaic sites across the region are interpreted as reflecting gradual, sustained population growth throughout the Archaic period. Specifically, beginning with relatively few early Archaic Jay phase (ca. 5500 to 4800 B.C.) sites, there is a progressive increase in the number of Bajada (ca. 4800 to 3200 B.C.), San Jose (ca. 3000 to 1800 B.C.), Armijo (ca. 1800 to 800 B.C.) and En Medio (ca. 800 B.C. to A.D. 400) phase sites over the region. As well, sites are larger by the San Jose phase and are accompanied by the first evidence of structures, probably constructed of poles and brush. The number and size of sites increases steadily in succeeding phases, all of which is consistent with the aggregation of larger groups of people, population growth, and repeated occupations of larger camps. The earliest evidence of domesticated crops, notably maize, appears during the Armijo

phase. Reliance on domesticates implies the need to maintain fields, as well as store any surpluses that might be generated. The appearance of maize in the archaeological record accompanied by the almost simultaneous appearance of more permanent structures and storage facilities.

Basketmaker II (ca. A.D. 1 to 500)

The Basketmaker II (BM II) phase represents the first successful agricultural populations developing sedentary settlements in the region. Dating from approximately A.D. 1 to A.D. 500, Basketmaker sites are found in southern Utah, southwestern Colorado, and eastern Arizona, as well as much of New Mexico. Due to the limited amount of research devoted to these sites, the relationship between late Archaic En Medio phase occupations and the BM II occupation is still poorly understood. The introduction of viable agricultural strains, in particular corn (*Zea mays*) as well as squash and beans is thought to have contributed to the adoption of sedentary habitations, generally aligned with perennial drainages in the Four Corners area. Shallow pit structures and extensive use of storage features mark the adoption of agriculture as a key feature of the occupation. Population aggregation is indicated by settlements with multiple structures. Upland settlements are also found which may represent seasonal use for farming plots as well as exploitation of faunal resources. The first use of ceramic artifacts also occur during the latter part of the period, with simple vessels constructed of alluvial clays similar to those manufactured by Mogollon populations far south of the region. Los Pinos phase sites cluster along the Pine and Animas rivers, with more intensive occupations to the north in Colorado. The first signs of population aggregation in the region are marked by the BM II period, with continuing population growth trends for the next 600 years.

Basketmaker III (ca. A.D. 500 to 700)

Basketmaker III (BM III) occupations in the San Juan Basin are characterized by the widespread adoption of domesticated crops accompanied by the appearance of pithouses, the advent of ceramic manufacturing, and the introduction of bow-and-arrow technology. Notable among the crops recovered from sites dating to this period are maize, squash, and beans. The adoption of agriculture, even in a nascent form, was probably facilitated by a return to increase in effective moisture over much of the Colorado Plateau during this period. Yet, indirect evidence of droughts during this period suggests that this was not a stable climate regime. As a consequence, BM III groups continued to rely on wild plants and animal resources, with agricultural products largely used to supplement wild resources. The presence of neighboring groups, who also depended on the same resources, would have constrained the ability of any one group to complete seasonal movements to obtain wild plant and animal resources. It is such constraints on movement, in conjunction with improved climate conditions, which are thought to have contributed to the more widespread adoption of cultivated crops during this period. Similarly, by late BM III times, a major population shift from the La Plata region into the central portion of the San Juan Basin had occurred, perhaps in response to improved agricultural conditions. Relative to earlier periods, BM III sites are far more visible due to longer occupations. The shift to domesticated crop is reflected by changes in settlement patterns during BM III times. Compared to earlier times, BM III sites are disproportionately oriented toward areas containing arable land. Agriculture in higher elevations would have been constrained by frost-free periods, while those in lower elevations would have been constrained by rainfall and surface water availability. It should be emphasized that agriculture during this period relied exclusively on direct rainfall; technologies such as irrigation to supplement water supplies have not been found. At the same time, there is evidence that BM III was not the same across all parts of the San Juan Basin. While the classic description of BM III emphasizes reliance on agriculture, there is some indication that early BM III groups in the southwestern and western portions of the basin continued to practice hunting-and-gathering to a much greater extent than agriculture. In contrast, there is evidence of greater agriculture in the Navajo Reservoir (Sambrito phase), accompanied by substantially higher populations.

Pueblo I (ca. A.D. 700 to 900)

The Pueblo I (PI) period on the Colorado Plateau generally is typified by an increase in the numbers of sites, and increase in average site size, the appearance of above-ground jacal and stone architecture alongside semi-subterranean pithouse structures, and larger storage facilities. Above-ground structures typically exhibit linear or oval configurations and contain about eight rooms per site. So-called "proto-

kivas" first make their appearance at some PI sites in the region. With the exception of the Chaco region, these trends are not thought to reflect population growth, but rather consolidation of previously distinct residential groups into larger villages. In the San Juan Basin, however, the overall number of PI sites is relatively low. This is attributed, in part, to deteriorating environmental conditions on the Colorado Plateau, specifically reduced rainfall and an increase in the overall variability of rainfall. Rainfall estimates appear relatively high between A.D. 700 and 750, but began a steady decline through the early A.D. 800s. Between A.D. 830 and 900, drought conditions are thought to have prevailed over much of the region. The highest concentrations of PI sites are situated in the Mesa Verde region, the easternmost manifestation of PI, termed the Rosa phase, differs slightly from sites situated further west. Here, settlements tend to be distributed not only along drainages, but as well on outwash fans to maximize agricultural production. Over much of the northern San Juan Basin, sites tend to be situated on mesas, broad ridges, or floodplain terraces overlooking drainages. As in BM III times, there is evidence for regional differentiation in subsistence patterns. In the southwestern portion of the San Juan Basin, sites assigned to the White Mound phases contain food remains indicating reliance on a mix of horticulture, hunting and gathering. In the northern San Juan Basin, Rosa-Piedra phase sites tend to contain relatively larger amounts of cultigens. In the center of the San Juan Basin, in Chaco Canyon, PI sites contain a similar mix of domesticated and wild resources, suggesting that drought conditions during this period caused subsistence strategies to remain diversified. To the east, reliance on domesticates appears to have been greater than in other parts of the basin. Recent research on PI communities in the Navajo Reservoir predecessor to the Great Kivas knows from the later Pueblo II and Pueblo III periods. Population growth and aggregation during this period is a critical factor in the development of the later complex communities and social structures present in the Pueblo II and Pueblo III periods in the region.

Pueblo II (ca. A.D. 900 to 1050)

The Pueblo II (PII) period is characterized by an increase in the number of sites, an increase in average site size, a shift toward above-ground coursed masonry architecture, the appearance of larger numbers and sizes of storage facilities, and the appearance of formal kivas. Limited Anasazi lithic/ceramic scatters and possible structures are anticipated as possible site types to be identified during the present inventory. Sites typically contain between six and nine rooms per site, primarily arranged in a linear fashion. Larger sites containing more numerous rooms are often laid out in a quadrilateral pattern around a central plaza. It is during the PII period that the Chaco phenomenon truly flourishes, accompanied by the establishment of very large sites, the appearance of multistoried room blocks, increasingly complex architectural elaboration of kivas, the advent of field systems in an effort to expand agricultural production, and the development of road systems to facilitate trade and exchange. These changes seem to signal a return to accelerating population growth in response to dramatically improved climatic conditions. Climatic reconstructions for the period indicate a return to higher rainfall levels, accompanied by episodic droughts. It is suspected that differential spatial distributions of critical resources became more pronounced in PII times over much of the San Juan Basin. Much of the PII period is typified by imbalances between people and resources, both temporally and geographically. Such imbalances necessitated the introduction of various buffering mechanisms in an effort to offset these imbalances. Among the buffering mechanisms inferred from the archaeological record were improved storage facilities, expansion of regional exchange networks, and more frequent abandonment and reestablishment of large villages in areas better suited for agriculture. One consequence is that PII sites often were occupied for relatively short periods of time. Subsistence practices indicate greater reliance on cultivated plants, although evidence of use of wild resources persists at most PII sites. Maize, beans, and squash are quite common at both large and small sites. Evidence of agricultural intensification derives from the identification and dating of the first water control structures in the San Juan Basin. These structures were designed to augment rainfall, thereby increasing overall productivity of given plots of land. Many of these water control devices seem to provide water to outwash fans, areas that are often marginal for direct rainfall agriculture. Earlier dissimilarities between sites in the southern San Juan Basin and those in the northern basin largely disappear during PII times. The emergence of region-wide (relative) homogeneity in ceramics, architecture, subsistence practices, and settlement patterns has been interpreted as evidence supporting the inference that region-wide trade and exchange systems emerge in full force during PII times. One notable exception to this homogeneity is found in the Chaco Canyon region, where settlement in the Chaco heartland is typified by numerous small habitation sites distributed around fewer, but very much larger and more complex towns (central places) containing kivas, great kivas,

reservoirs, dams, and roads. Sourcing studies suggest that non-local materials were being imported from far-flung parts of the Southwest. These facts, combined with the pan regional distribution of ceramics that are virtually identical, suggests that Chaco Canyon may have been the primary focal point for trade and exchange networks whose limits extended into northeastern Arizona, southern Colorado, and west-central New Mexico. Analyses of ceramics and chipped stone indicate that source areas for such critical resources gradually shifted over time from the southeastern part of the area (Zuni) to the western (Chuska) region and, finally, to the northern portion of the San Juan Basin. It is likely that these regions approximate the outer limits of this exchange and trading network. There is some evidence suggesting that turkey and perhaps corn were among the crucial subsistence resources being imported into the Chaco region. If such inferences are accurate, reliance on imported foodstuffs underscores the tenuous agricultural conditions that prevailed across the central San Juan Basin during PII times.

Pueblo III (ca. A.D. 1050 to 1300)

The Pueblo III (PIII) period is typified by the aggregation of populations into progressively larger centers, accompanied by the gradual collapse of the Chaco phenomenon that so defines early and middle PII times. Some researchers suggest that populations began to move northward into the northern San Juan Basin near Aztec, as well as southward out of the Mesa Verde region. Concurrent with Chaco's gradual decline in importance is a seeming realignment of social interaction spheres northward toward Mesa Verde. For example, sites along the Chuska Mountains seem to evidence a period of increased building events, accompanied by the replacement of Chacoan ceramics with those more typical of Mesa Verde. As well, the appearance of bi- and tri-wall building, nominally characteristic of the Mesa Verde region at sites in the San Juan Basin, suggest the gradual outward expansion of Mesa Verde peoples into areas formerly containing Chaco components. Over much of this period, sites contain between 13 and 30 rooms, with larger sites exhibiting upwards of 200 rooms. These changes are attributed to the onset of a period of dramatically decreased rainfall after ca A.D. 1220, accompanied by increased spatial variability in rainfall across the basin as a whole. Areas adversely affected by reduced rainfall, the central and southern San Juan Basin, seem to act as donor areas for population out-migration, while areas less subject to reduced rainfall, like the Mesa Verde and McElmo regions, become recipient areas for immigrants. Many parts of the Basin appear to have been abandoned toward the terminal portion of the PIII period. Further, as noted in the PII discussion, dual PII-PIII components are quite common across the region.

Pueblo IV (ca. A.D. 1300 to 1540)

Further movements of peoples into riverine valleys where relatively more reliable surface water supplies are found characterize the Pueblo IV (PIV) period. This marks an end to higher elevation agricultural endeavors dependent on rainfall and, perhaps, the explicit recognition that agriculture, if it was to be successful, had to rely on surface water. Sites dating to this period are generally small, containing between one and four rooms. A small subset of sites contains 100 rooms, while an even smaller subset of the largest sites contains upwards of 500 rooms. Major settlements dating to this period are situated primarily in the Rio Grande, Rio San Jose, and Zuni River watersheds. During this period, the first evidence of direct diversion irrigation systems appears among the pueblos along the Rio Grande. Material culture also became more elaborate. For example, PIV coincides with the introduction of glaze-decorated ceramics and the use of red and yellow slips. Other examples of PIV material culture include mural paintings, petroglyphs, and stone effigies, decorated pipes, and carved bone tools.

Historic Period (ca. A.D. to 1540 to Present)

Navajo Occupation

Navajo cultural sites in the region constitute a high percentage of the historic period. These sites encompass a full range of types and include but are not limited to scatters of artifacts, game drives, small and large habitations, trails, and rock art. The culture and history of the Navajo people is also intertwined with a varied and diverse landscape that recognized places that have pan-tribal as well as local significance. Strictly Navajo chronology is generally expressed in a series of phases that include the Dinéah (1540 to mid- 1600s), Gobernador (mid- 1600s to 1770), Cabezon (1770 to 1863), and Reservation phases (1863 to present). Materials that may be earlier than these defined phases has yet to be clearly defined.

Dinéah/ Gobernador Phases (ca. A.D. 1500 to 1753)

Early Navajo occupation of northwest New Mexico is documented from at least the Abiquiu/Chama River area extending west to concentrations at the eastern ends of San Juan County and the western ends of Rio Arriba County, in what is known as Dinéah ("Among the People"). Early Navajo sites are also known from the southern reaches of the San Juan Basin and in the Rio Puerco drainage, most notably at Big Bear Mesa and Chacra Mesa. Although a growing body of evidence indicates that the Dinéah and Gobernador phase sites were more widely distributed across the San Juan Basin and the Colorado Plateau in general than previously believed only a few years ago, the greatest occurrence remains the Dinéah area, and elsewhere the numbers are far lower. Regardless of where early Navajo sites may be found on the Colorado Plateau, Dinéah is the type locality for comparative purposes with other early Navajo sites. The Navajo of the period represent an evolving tradition originating out of hunting and gathering existence to one that enhanced those traditions with the agricultural practices and some of the ceremonial practices of the Pueblo world, and the pastoral economies introduced by the Spanish. Some important characteristics of the Navajo of the period include forked-pole hogans, defensive masonry pueblitos, elaborate ceremonially based rock art, plain gray and polychrome ceramics, low frequencies of trade ceramics from nearly all pueblo areas, distinctive stone tool styles, agriculture, and pastoral economies. Many of the sites, particularly in the 18th century, are located in defensive locations. Sometime around A.D. 1760 to 1770, the Dinéah Navajo had moved or was in the final stages of moving into other areas of the Colorado Plateau and Dinéah was effectively depopulated. Archaeological data shows little evidence for site occupation or construction after this time. Concurrent with this movement away from Dinéah, the Navajo appear to have experienced a revitalistic movement that prescribed the discarding of certain Puebloan traits such as painted pottery, masonry houses, and permanent ceremonially oriented rock art.

Cabazon Phase (ca. A.D. 1753 to 1868)

Cabazon phase Navajo sites are less well documented but nonetheless are present in the region. They are rarely reported, even by large-scale multi-thousand acre surveys. Problems with recognition and site dating during field surveys may account for some of the rarity of Cabazon phase sites. This period can be viewed as one during which the widely dispersed Navajo population may have begun coalescing into the areas encompassed by the modern day limits of the reservation. Cabazon phase sites are characterized by a continuation of many of the economies present in the earlier phases, with perhaps a decline in agriculture and increasing reliance in pastoral pursuits. As previously noted, many of the obvious puebloan traits seem to have disappeared or receded in importance. Fortified defensive sites still occur but on a much smaller scale. Circular masonry hogans and cribbed-log hogans occur along side the earlier forked-pole Hogan and may begin to gain predominance during this phase. Antelope game traps are first identified during this phase. Artificially, there are sporadic occurrences of polychrome ceramics and the plain gray styles continue with some minor but notable technological distinctions that distinguish it from earlier types. Near the end of the phase, glass and metal artifacts begin to occur more often but in limited numbers.

Reservation Phase (ca. 1868 to Present)

Reservation phase sites span the time from the Kit Carson campaign (A.D. 1863 to 1864) and subsequent internment at Bosque Redondo (A.D. 1863 to 1868), to the present time. Post-Bosque Redondo 19th century sites amount to only about 1 percent or less of total Navajo sites. This time period witnesses a near complete replacement of forked-pole hogans by circular forms, and in later years the adoption of housing styles from the dominant non-Native culture. Pastoral economies continue to gain preeminence with livestock herds in the thousands not uncommon. As the population grew and natural limits to pastoral economies were encountered, wage labor made significant inroads into the local economies and became increasingly important in supplementing the traditional economies. Small and large habitations sites often represent sites of this period. The occasional abandoned hogan or "home site" areas are found, often completely salvaged of useable materials. Other sites include those associated with pastoral activities such as corrals and camps. The occurrence of these sites is particularly noticeable within the Eastern Navajo Agency where land patterns follow a checkerboard pattern and the use of public lands is historically common. In areas where public lands are less fragmented, reservation era sites are much less frequent. Historic Reservation Phase sites are anticipated as possible site types to be identified during the present inventory.

Spanish Colonial Period (A.D. 1540-1821)

The earliest evidence of Spanish entry (*entrada*) into New Mexico is associated with the appearance of Coronado's expedition in 1540 (Winship 1990). Initial contacts with the inhabitants were not promising insofar as the Spaniards, prompted by Marcos' reports of great wealth, viewed the region's inhabitants as potential sources of wealth or information about where such wealth could be found (Winship 1990). Greeted by showers of arrows at some pueblos, Coronado's men soon found that reports of gold were overstated and that their likely reception in other villages would be equally confrontational (Winship 1990). In 1542, after smaller expeditions into the surrounding country reveal no great wealth, Coronado's expedition withdrew to Mexico. The Spanish did not return to the region until several decades had passed. In 1598, Oñate arrived with a large party of colonists, soldiers, and priests, to establish the village of San Gabriel, near the modern-day Pueblo of San Juan. This marked the first serious attempt to establish permanent settlements in the region. According to Salmerón (1966), Oñate found little of the wealth that had prompted Coronado's expedition some 50 years earlier. In 1604, Oñate traversed portions of the region on his way to the Hopi Mesas and thence westward to California (Salmerón 1966). He returned by the same route, but did not establish any new Spanish settlements along the way. It is during Oñate's travels that we find the first written reference to the presence of Navajo Indians in what is today the Navajo heartland; they were referred to by Salmerón as "Apache Indians of Nabaju" (1966). There is almost no documentary evidence regarding the region between Oñate's arrival in 1598 and the Pueblo Revolt of 1680. Seventeenth century Spanish settlements in the area were minimal and concentrated almost solely in or near the Rio Grande Valley. During this period, small settlements such as San José de Guisewa (1620) pushed westward into the region, only to be abandoned shortly thereafter (Williams 1986). It is reasonable to assume that Spanish settlement brought new technologies and ways of life to indigenous peoples. Some of the most important introductions were the use of metal, the introduction of domestic animals and, to the detriment of the region's inhabitants, Old World diseases. By 1650, sheep and goat husbandry appear as progressively more important components of Navajo subsistence. This inference is further supported by the archaeological recovery of European goods at seventeenth century Navajo sites, although it is unclear whether these goods were obtained by raiding or rebellion that followed Vargas' 1692 Reconquest of New Mexico, was accompanied by the relocation of the inhabitants of some Rio Grande pueblos. Including both Tanoan- and Keresan-speaking elements, this population dispersal probably accelerated the adoption of Puebloan cultural elements-notable masonry architecture and painted pottery-into Navajo culture during the eighteenth century. Vintage Spanish documents, supported by substantial archaeological evidence, suggest defensively sited Navajo hogans and pueblitos, likely in response to raiding by both the Utes and Comanches, as well as threats from the Spanish. In addition, there appears to have been some Navajo dislocations southward during the eighteenth century focused primarily on consolidating their holdings in the Rio Grande valley. Settlements in the heart of the region were almost non-existent. Exceptions to this generality include, for example, the settlement of Rande de la Posta (1780). Yet, two activities-new land grants and new trading routes-emerge as important events affecting the region during this period. As in the seventeenth century, new land grants were established in the eighteenth century, mostly along the eastern margin of the region (Williams 1986). These included Plaza Colorado (1739), Plaza Blanca (1739), Cañada de Cochiti (1740), Abiquiu (1754), Polvadera (1766), and Piedre Lumbre (1766). Some, such as Ponderosa (1768) were established and have remained occupied, while others such as La Ventana (ca. 1778) were soon abandoned due to raiding (Juryan 1996, Swadesh 1974). It was also during the eighteenth century that the Old Spanish Trail was established (Crampton and Madsen 1994). The Old Spanish Trail is a collective assortment of pack routes connected Santa Fe and Los Angeles. It was first traversed in its entirety in 1829 and experienced about 20 years of use by traders, slavers, trappers, and immigrants until being replaced by other trails. It undoubtedly followed older Native American trail routes in some areas and portions that had been identified, but segments of the trail followed Largo Canyon (Armijo Route) and Carracas Canyon (Northern Route).

Mexican Period (A.D. 1821-1848)

Mexico's declaration of independence from Spain in 1821 was accompanied by the opening of the Santa Fe Trail. This inaugurated a period of progressively greater interaction between Euro-Anglos from America and New Mexico's Native American and Hispanic residents. Excluding events taking place in Navajo country, discussed earlier, this period is not particularly noteworthy with respect to Mexican activities in the region. There were additional Mexican land grants finalized during this period, including most notably

the San Joaquín del Rio Chama (1806, Swadesh 1974), Tierra Amarilla grant (1832, Swadesh 1974), Baca Location #1 (1835), and the Lobato grant (Williams 1986). As well, small towns such as Gallina (1818) and Cabezon (1826) also appeared in the region. Trading across the Old Spanish Trail, discussed above, intensified during the Mexican Period and included both Mexican and Anglo traders (Swadesh 1974). Many of the alternate routes along the trail, which shortened its distance, were identified and used by traders traveling to California. According to Frenchman, Dufлот de Mofras (BLM 2002a), caravans traveled once a year from New Mexico to Los Angeles. These consist of 200 men on horseback, accompanied by mules laden with fabrics and large woolen covers called serapes, jerzas, and cobertones, which are valued at 3 to 5 piasters each. This merchandise was exchanged for horses and mules on a basis, usually of two blankets for one animal. Caravans left Santa Fe, New Mexico, in October, before the snows set in, and finally reach the outlying ranchos of California from where the trail leads into El Pueblo de los Angeles. This trip consumed two and one-half months. Returning caravans left California in April in order to cross the rivers before the snow melts, taking with them about 2,000 horses. Thus, while trade expanded during the Mexican Period, settlements and associated populations remained largely restricted to the Rio Grande Valley and its major tributaries. Aside from periodic trading expeditions, the region was instead typified by Navajo settlements.

Euro-Anglo Period (1848 to Present)

In 1846, Doniphan's California Column entered New Mexico, ushering in a new era in the region's history. With the subsequent defeat of the Mexican Army, New Mexico officially became a territory of the U.S. conditions during the period between 1848 and the outbreak of the Civil War remained largely unchanged from those observed during the Mexican Period. Anglo or Hispanic settlements were very few in number and still concentrated mostly in the Rio Grande basin. At the same time, largely in response to raiding by Native Americans, there was an increasing presence of U.S. military forces. Indeed, this period is marked by the appearance of a succession of forts (Acrey 1994, Williams 1986). These included Ft. Defiance (1851), Ft. Wingate (1849, 1862, 1868), Ft. Lowell (1866) and an unnamed Army post west of Haynes Station (1870s). The chaos that seemed to characterize the newly-acquired territory grew even worse with the outbreak of the Civil War. Between 1861-1862, Confederate forces seized a series of Union posts beginning in El Paso, TX, and extending northward up the Rio Grande toward Santa Fe. Only after the Confederates were defeated at the Battle of Glorieta Pass in the spring of 1862 did any semblance of order return to the territory. By 1865, the Santa Fe-Durango stage route extending from Santa Fe northwestward through San Ysidro, Cuba, Haynes Station, Truby Stop, and Largo to Aztec had been established in an effort to improve communications and travel in the region (Williams 1986). This stage line was to remain in operation until 1881. Perhaps the most notable event of the Civil War period was the attempt to remove all Navajo from their homelands. Termed "The Long Walk," this saw the removal of upwards of 10,000 Navajo from the eastern part of their traditional homeland (Ackerly 1998, Bailey 1988). This effort proved largely a failure, due in no small measure to Carleton's gross underestimate of the population of the Navajo Nation. By 1868, the reservation at Bosque Redondo (Ft. Sumner) was abandoned and the Navajo returned to their homeland. The initial impetus for Anglo settlement in the region can be traced to passage in 1856 of the Homestead Act. Intended to promote settlement of the American West, the Act provided 160 acres to claimants once they "proved up" their claim by living and working on it. In the region, however, homesteading was inhibited by deteriorating conditions between settlers and Navajos, as well as constraints imposed by the outbreak of the Civil War in 1862. Further, since land ownership was unclear, settlements in the region did not emerge until the late 1870s. Among the earlier Hispanic settlements in the region are Blanco (1879), Cuba (1887) and Rosa (1888). Anglo settlements included Aztec (1879), Bloomfield (1879), Farmington (1879), Lumberton (1881), Dulce (1883), Cedar Hill (1887), San Luis (1890), Fruitland (1891), and Sheep Springs (1892). Others such as Fairpoint (1894-1898), Pendleton (1903-22), Liberty (1907-1920), Haynes (1908-1929), and Gobernador (1916-1942) were established only to be abandoned within a few years or decades (Williams 1986). Many initial economic activities typical of the mid-late nineteenth century focused on farming and ranching. Farming varied from rainfall-based dry land farming in upland areas to irrigated agriculture in river valleys that had relatively permanent flows. The establishments of settlements listed above were almost invariably accompanied by the immediate construction of irrigation ditches (Ackerly 2002). For example, the La Plata Indian and McDermott ditches in the La Plata basin are believed to date to the late 1870s. In the Animas basin, the Star ditch is believed to date to the late 1870s. Irrigation systems drawing water from the San Juan River and dating to ca. 1880 include the Hammond Conservancy District, Castiano Ditch, San Juan #4, and Cuadi Ditch. Ranching

focused almost exclusively on sheep, although some cattle were also raised. Sheep ranching expanded rapidly, with totals in the state increasing from 250,000 in 1830 to upwards of 4,000,000 in 1880. Beginning in the 1850s and persisting through the 1860s, there were trail drives of large herds westward along a route that closely paralleled the Old Spanish (Williams 1986). By the early twentieth century, there were 1.8 million head of sheep on the Navajo Reservation, comprising almost 93 percent of all livestock (Acrey 1994). The rapid pace of settlement, accompanied by expansion of both farming and ranching, led to the construction in 1881 of the "Farmington Branch" of the Denver and Rio Grande Western Railroad. Intended largely to transport commodities, particularly fruit, northward and manufactured goods into the San Juan Basin, a spur line extending from Durango, CO, southward to Aztec and Farmington was completed in 1905 (Myrick 1990). What is perhaps most notable is that this spur was standard gauge, a novelty on the Denver and Rio Grande Western Railroad's system of narrow-gauge rails; it was replaced with narrow-gauge rails in 1923 (Myrick 1990). In Navajo county, the late nineteenth century and early twentieth century were characterized by the establishment of numerous trading posts. Beginning in 1869, trading posts associated with army garrisons at Ft. Defiance and Ft. Wingate were opened for Navajo trade (Acrey 1994). In the mid-1880s, a trading post was opened in Fruitland (Acrey 1994), soon followed by trading posts at Crystal (1892) and Two Gray Hills (1897). Trading posts provided both an outlet for goods, notably blankets and jewelry, produced by Navajo craftspeople, as well a source for manufactured Anglo goods. Historic Euro-Anglo components comprise only 3.1 percent of the known components in the region. Most are situated along the eastern margins of the region, mirroring the locations of early settlements as described above.

PREVIOUS ARCHEOLOGICAL WORK

Prior to the fieldwork a site records search of the Navajo Nation Historic Preservation Department in Window Rock was done on August 8, 2007. Two previously recorded sites occur within 100 meters of the project area. They include LA 8398 and LA 8399, both Anasazi Pueblo III period habitation sites. These sites were never assigned a Navajo Nation site number.

FIELD METHODS

A 100 percent pedestrian survey (Class III) of the 105.67 acres was conducted on August 23, 2007. Parallel transects spaced at an interval of no greater than 15 m (50 ft) were used to examine the parcel. Cultural resource sites were documented using standard Navajo Nation forms and procedures. Cultural resources were recorded as a site using the following criteria: The location of an event, belief, or activity, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself maintains historic archaeological, or traditional cultural value regardless of the value of any existing structure. Resources not meeting these criteria, or in a severely disturbed or highly mobile context, were recorded as isolated occurrences. All previously recorded sites were assigned a Navajo Nation site number and updated. An isolated occurrence is any non-structural remains of a single event; alternatively 10 square m (108 square ft) or less, especially if it is of questionable human origin or if it appears to be the result of fortuitous causes. All cultural resources were documented using standard procedures and forms. No ground disturbing activities were conducted and no artifact collections were made.

The project area exhibits moderate to heavy amounts of disturbance by previous land use activities. The entire 105.67 acre parcel had some evidence of active livestock grazing. Approximately 35-40% of the parcel exhibited evidence of numerous abandoned and capped oil wells. Also, a small gravel pit is located in the north-central portion of the parcel. Finally, numerous two-track roads bisect the parcel throughout. Survey visibility was excellent, usually exceeding 80 percent. Weather during the survey was hot and generally clear.

NATIONAL REGISTER of HISTORIC PLACES

No sites identified within or adjacent to the current project areas are listed on the National Register of Historic Places.

SURVEY RESULTS

A total of three previously recorded archaeological sites and seven isolated occurrences were identified and described in detail in the following sections.

Previously Recorded Archeological Sites

NM-H-20-140 (LA 5740)

Land Status: Navajo Nation Trust (San Juan Chapter)
Site Type: Habitation (Roomblock) with Artifact Scatter
No. of Components: 2
Cultural Affiliation: Anasazi and Unknown Historic
UTM: Zone 12; 717087 E, 4068840 N

SITE DESCRIPTION: NM-H-20-140 (LA 5740) (Appendix A Maps 1 and 2; Photos 1-5) is a Late Pueblo II-Early Pueblo III period habitation site and small unknown historic component situated on the edge of a bluff overlooking the San Juan River on its south side. The site was originally recorded by the New Mexico Laboratory of Anthropology in 1961 and given a New Mexico Laboratory of Anthropology site number. A Navajo Nation site number has never been assigned. The site measures approximately 42 m N/S x 59 m E/W with a total area 2478 sq. m. The site has been bisected on its southern/southwestern edge by a two-track road. The grassland vegetation community consists of an understory of sage, fourwing saltbush, broom snakeweed, various grasses, and forbs. Soils across the site consist of light brown Aeolian sands and residual clayey loams from the surrounding decomposing sandstone formations.

There is a significant seven-room pueblo (Feature 1) identified. The pueblo measures approximately 22 m E/W x 18 m N/S and appears to be somewhat L-shaped. The roomblock is constructed of locally available quartz river cobbles. No kiva depression is visible; however due to the size of the roomblock and the presence of other kivas at similar pueblos dating to the Pueblo III period immediately adjacent to the west, it is probable that a kiva is present.

The assemblage observed on site includes flaked lithics, groundstone, and ceramics. As estimated 20 flaked lithic artifacts were observed and include primary reduction flakes exhibiting utilization. Raw materials present include fine-grained quartzite, Washington Pass chert, chalcedony, basalt, and silicified wood. Groundstone identified includes several small sandstone mano and metate fragments. Ceramics were the dominant artifact type observed across the site boundary and include sherds representing bowls and jars. Types represented include McElmo Black-on-white, Mesa Verde Black-on-white, Wingate Black-on-red, and corrugated wares that were originally defined as Mancos Corrugated, and Mesa Verde Corrugated. Ceramics are estimated to exceed 100 artifacts. Most of the ceramics are small sherds and it appears likely that the site has been subject to surface collection through the years due to its immediate proximity on two-track roads and a now abandoned oil field.

The second component is an unknown historic component. The component is defined by the presence of a disturbed push-pile of sandstone blocks (Feature 2) with associated historic artifacts. The sandstone blocks have been pushed into a rough linear alignment by mechanized equipment. The sandstone arrangement may have been the remains of a structure or as yet to be define feature and measures approximately 4.5 m long x 1.5 meters wide. The artifact assemblage surrounding the feature includes decomposed pieces of metal, tobacco tins, and broken brown glass. The component does not contain any definitive diagnostic artifacts; however it is estimated to date to early to mid 1900s.

ELIGIBILITY RECOMMENDATION: The site consists of a Late Pueblo II-Early Pueblo III period habitation site and a small, disturbed unknown historic component. Significant soils deposits are present across the defined site boundary surrounding and within the defined features. The site is likely to yield important chronological, settlement, and subsistence data concerning the Pueblo II period of the region. The historic component is heavily disturbed and is not likely to yield any significant data. The site is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site's Anasazi component contains materials that are greater than

100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific cultural affiliation or religious expression.

NM-H-20-141 (LA 8398)

Land Status: Navajo Nation Trust (San Juan Chapter)
Site Type: Habitation (Roomblock) with Artifact Scatter
No. of Components: 1
Cultural Affiliation: Anasazi
UTM: Zone 12; 716858 E, 4069015 N

SITE DESCRIPTION: NM-H-20-141 (LA 8398) (Appendix A Maps 1 and 3; Photos 6-11) is Late Pueblo II-Early Pueblo III period habitation site situated on the edge of a bluff overlooking the San Juan River on its south side. The site was originally recorded by Jack Wilson in 1963 and given a New Mexico Laboratory of Anthropology site number. A Navajo Nation site number has never been assigned. The site measures approximately 27 m N/S x 42 m E/W with a total area 1134 sq. m. The site has been bisected on its southern end by a two-track road. The grassland vegetation community consists of an understory of sage, fourwing saltbush, broom snakeweed, various grasses, and forbs. Soils across the site consist of light brown Aeolian sands and residual clayey loams from the surrounding decomposing sandstone formations.

There is a significant six-room pueblo (Feature 1) and small cobble mound (Feature 2) located 7 meters to the east/southeast. The pueblo is somewhat T-shaped and measures approximately 13 m E/W x 8 m N/S. There are a total of six rooms. Five of the rooms are arranged in an E/W line with one room extending to the south of the second room on its west side. The roomblock is constructed of locally available quartz river cobbles. The small cobble mound measures 3m in diameter and has ceramic artifact disbursed across it. The function of this small mound has originally described as the product of cobble removal from a kiva during its construction. A second gravel mound is located on the western fringes of the site boundary; however no artifacts are associated with it. The original site recording mentions two kiva depressions in association with these two gravel mounds. The present site update cannot validate this assessment. Only one depression was identified next to the gravel mound on the western side of the site and it appears more likely to be the result of mechanical excavation prior to the original site recording. It closely resembles a small excavated pit that is somewhat squared as if removed by a backhoe bucket.

The assemblage observed on site includes flaked lithics, groundstone, and ceramics. An estimated 25 flaked lithic artifacts were observed and include primary reduction flakes exhibiting utilization. Raw materials present include fine-grained quartzite, Washington Pass chert, chalcedony, basalt, and silicified wood. Groundstone identified includes several small sandstone mano and metate fragments. An estimated 10 specimens were observed. Ceramics were the dominant artifact type observed across the site boundary and include sherds representing bowls and jars. Types represented include McElmo Black-on-white, Mesa Verde Black-on-white, Wingate Black-on-red, and corrugated wares that were originally defined as Mancos Corrugated, and Mesa Verde Corrugated. Ceramics are estimated to exceed 100 artifacts. Most of the ceramics are small sherds and it appears likely that the site has been subject to surface collection through the years due to its immediate proximity on two-track roads and a now abandoned oil field.

The second component is an unknown historic component. The component is defined by the presence of a disturbed push-pile of sandstone blocks (Feature 2) with associated historic artifacts. The sandstone blocks have been pushed into a rough linear alignment by mechanized equipment. The sandstone arrangement may have been the remains of a structure or as yet to be define feature and measures approximately 4.5 m long x 1.5 meters wide. The artifact assemblage surrounding the feature includes decomposed pieces of metal, tobacco tins, and broken brown glass. The component does not contain any definitive diagnostic artifacts; however it is estimated to date to early to mid 1900s.

ELIGIBILITY RECOMMENDATION: The site consists of a Late Pueblo II-Early Pueblo III period habitation. Significant soils deposits are present across the defined site boundary surrounding and within the defined features. The site is likely to yield important chronological, settlement, and subsistence data

concerning the Pueblo II period of the region. The site is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific cultural affiliation or religious expression.

NM-H-20-142 (LA 8399)

Land Status: Navajo Nation Trust (San Juan Chapter)
Site Type: Habitation (Roomblock) with Artifact Scatter
No. of Components: 1
Cultural Affiliation: Anasazi
UTM: Zone 12; 716913 E, 4068974 N

SITE DESCRIPTION: NM-H-20-142 (LA 8399) (Appendix A Maps 1 and 4; Photos 12-16) is Late Pueblo II-Early Pueblo III period habitation site situated on the edge of a bluff overlooking the San Juan River on its south side. The site was originally recorded by Jack Wilson in 1963 and given a New Mexico Laboratory of Anthropology site number. A Navajo Nation site number has never been assigned. The site measures approximately 28 m N/S x 41 m E/W with a total area 1148 sq. m. The site has been bisected on its southern end by a two-track road. The grassland vegetation community consists of an understory of sage, fourwing saltbush, broom snakeweed, various grasses, and forbs. Soils across the site consist of light brown Aeolian sands and residual clayey loams from the surrounding decomposing sandstone formations.

There is a significant eight-room pueblo (Feature 1) identified. The pueblo measures approximately 17 m E/W x 9 m N/S. There are what appears to be a total of eight rooms. The upper northeast corner of the pueblo, which is presently defined as a room may actually be a bi- or a tri-wall is a common construction practice within the region during the Pueblo III period. Immediately south of the room or bi/tri-wall in the northeastern corner is a kiva depression (Feature 2). It measures 4m in diameter and the depression is approximately .5m deep. The roomblock is constructed of locally available quartz river cobbles.

The assemblage observed on site includes flaked lithics, groundstone, and ceramics. An estimated 20-30 flaked lithic artifacts were observed and include primary reduction flakes exhibiting utilization. Raw materials present include fine-grained quartzite, Washington Pass chert, chalcedony, basalt, and silicified wood. Groundstone identified includes several small sandstone mano and metate fragment. Eight specimens were observed. Ceramics were the dominant artifact type observed across the site boundary and include sherds representing bowls and jars. Types represented include McElmo Black-on-white, Mesa Verde Black-on-white, Wingate Black-on-red, and corrugated wares that were originally defined as Mancos Corrugated, and Mesa Verde Corrugated. Ceramics are estimated to exceed 100 artifacts. Most of the ceramics are small sherds and it appears likely that the site has been subject to surface collection through the years due to its immediate proximity on two-track roads and a now abandoned oil field.

ELIGIBILITY RECOMMENDATION: The site consists of a Late Pueblo II-Early Pueblo III period habitation. Significant soils deposits are present across the defined site boundary surrounding and within the defined features. The site is likely to yield important chronological, settlement, and subsistence data concerning the Pueblo II period of the region. The site is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific cultural affiliation or religious expression.

Isolated Occurrences

A total of seven isolated occurrences were recorded. They are described below in Table 1. No additional prehistoric cultural remains were observed in the vicinity. HAS believes the field recording of the isolates has exhausted their informational potential. These remains, therefore, do not require and further investigation.

IO#	DESCRIPTION	UTM Zone	EASTING	NORTHING
1	McElmo Black-on-white sherd	12	717216	4068735
2	Mesa Verde Black-on-white sherd	12	717047	4068670
3	Mancos Corrugated sherd	12	716842	4068676
4	McElmo Black-on-white sherd	12	716686	4068677
5	McElmo Black-on-white sherd	12	716631	4068908
6	Indeterminate corrugated sherd	12	716527	4069119
7	Mesa Verde Black-on-white sherd	12	716364	4069220

TRADITIONAL CULTURAL PROPERTIES

Local residents were interviewed regarding the presence of religious, ceremonial, burials, and/or culturally sensitive areas on the project area, or the immediate environs. On August 23, 2007, Richard Burleson, supervisory archaeologist spoke with three local residents, Frank Sands, Miranda Sands, and James Yazzie. No traditional cultural properties were identified during the ethnographic inquiries. Miranda Sands did indicate knowledge of Anasazi ceramics within the project area.

CULTURAL RESOURCE RECOMMENDATIONS

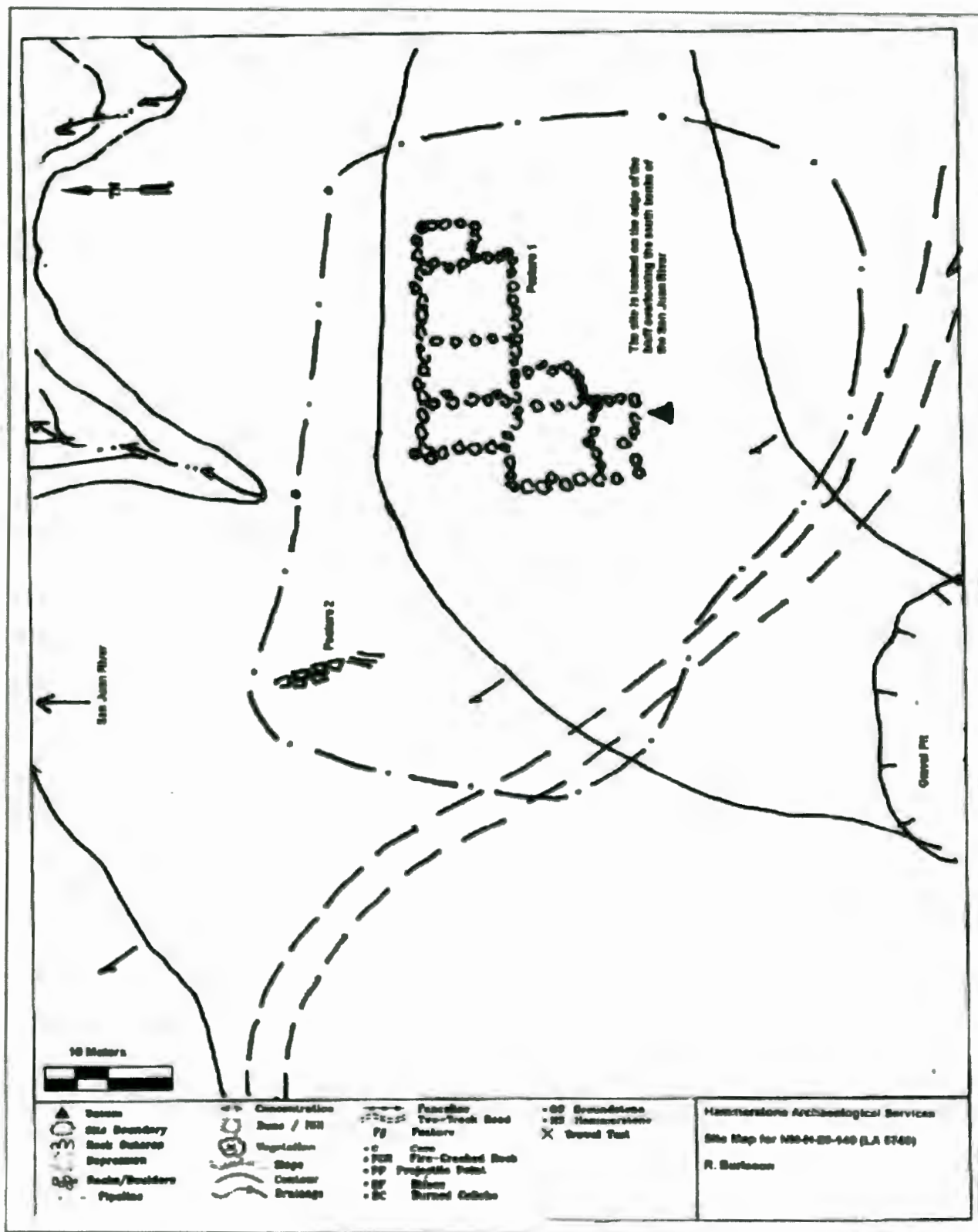
Three previously recorded archaeological sites and seven isolated occurrences were discovered within the proposed project area and it has been determined that there will be no adverse effect by the proposed project undertaking. Site NM-H-20-140 (LA 5740) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-120-141 (LA 8398) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. Site NM-H-120-142 (LA 8399) is recommended as eligible for inclusion to the National Register of Historic Places under criterion D, information potential (36 CFR 60.4). The site contains materials that are greater than 100 years old and are of archaeological interest and therefore warrants protection under the Archaeological Resource Protection Act. The site materials do not warrant protection under the American Indian Religious Freedom Act as they cannot be related to a specific religious expression. The architectural features located at each site are constructed of materials that would be sought after by the mining operation; however they are located along the extreme perimeter of the project area along the southern bluffs overlooking the south banks of the San Juan River. According to Robert Whitehorse, the proposed head of mining operations, this area will not be mined due to its proximity to the bluffs overlooking the river for safety concerns. It is recommended however: that protective fencing be placed around the site boundaries along with a 10 meter buffer to prevent and inadvertent trespass or vehicular/mechanical disturbance. The seven isolated occurrences identified are not likely to yield significant data towards our present understanding of the prehistoric or historic periods of the region. Therefore, the isolates do not require and further investigation.

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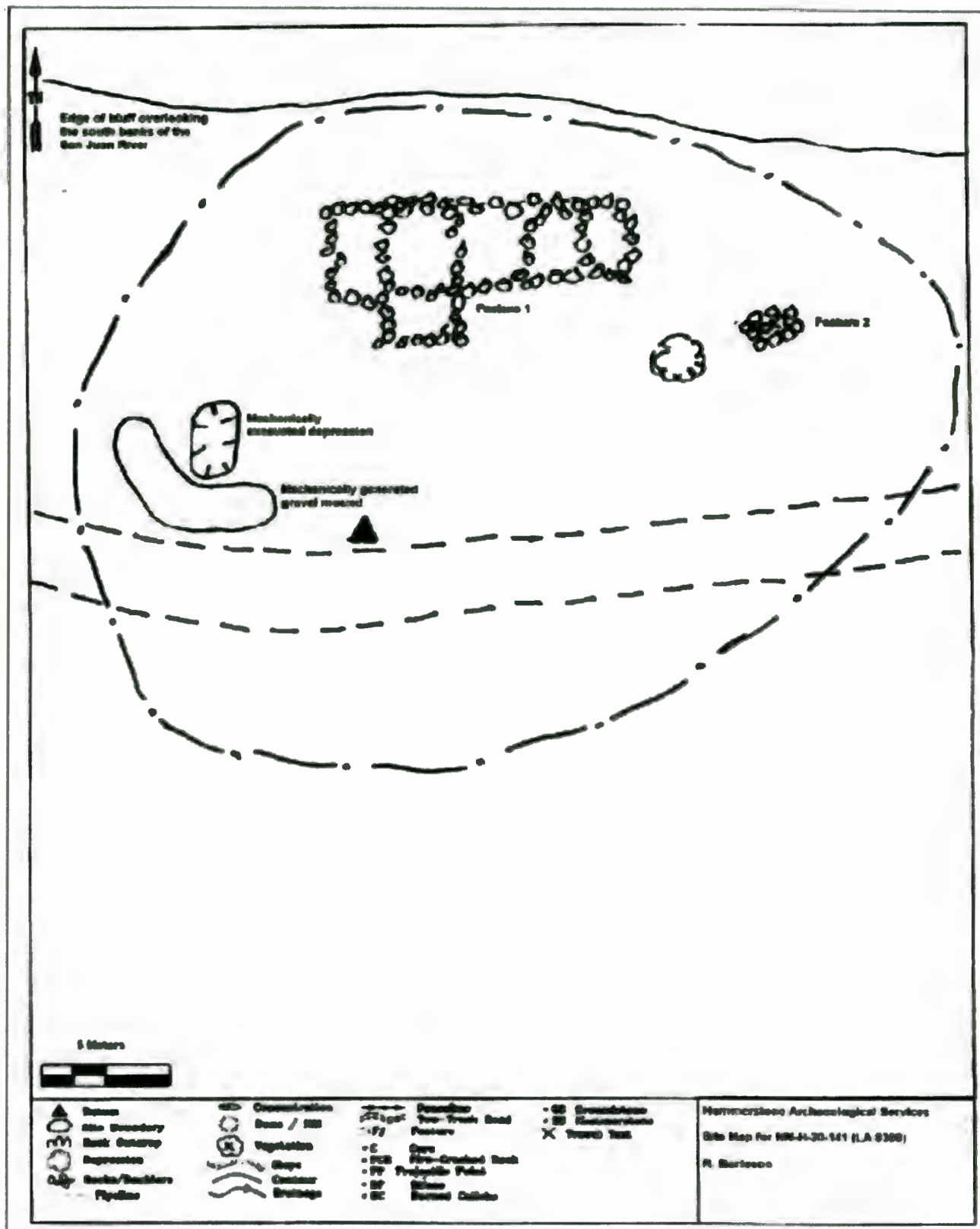
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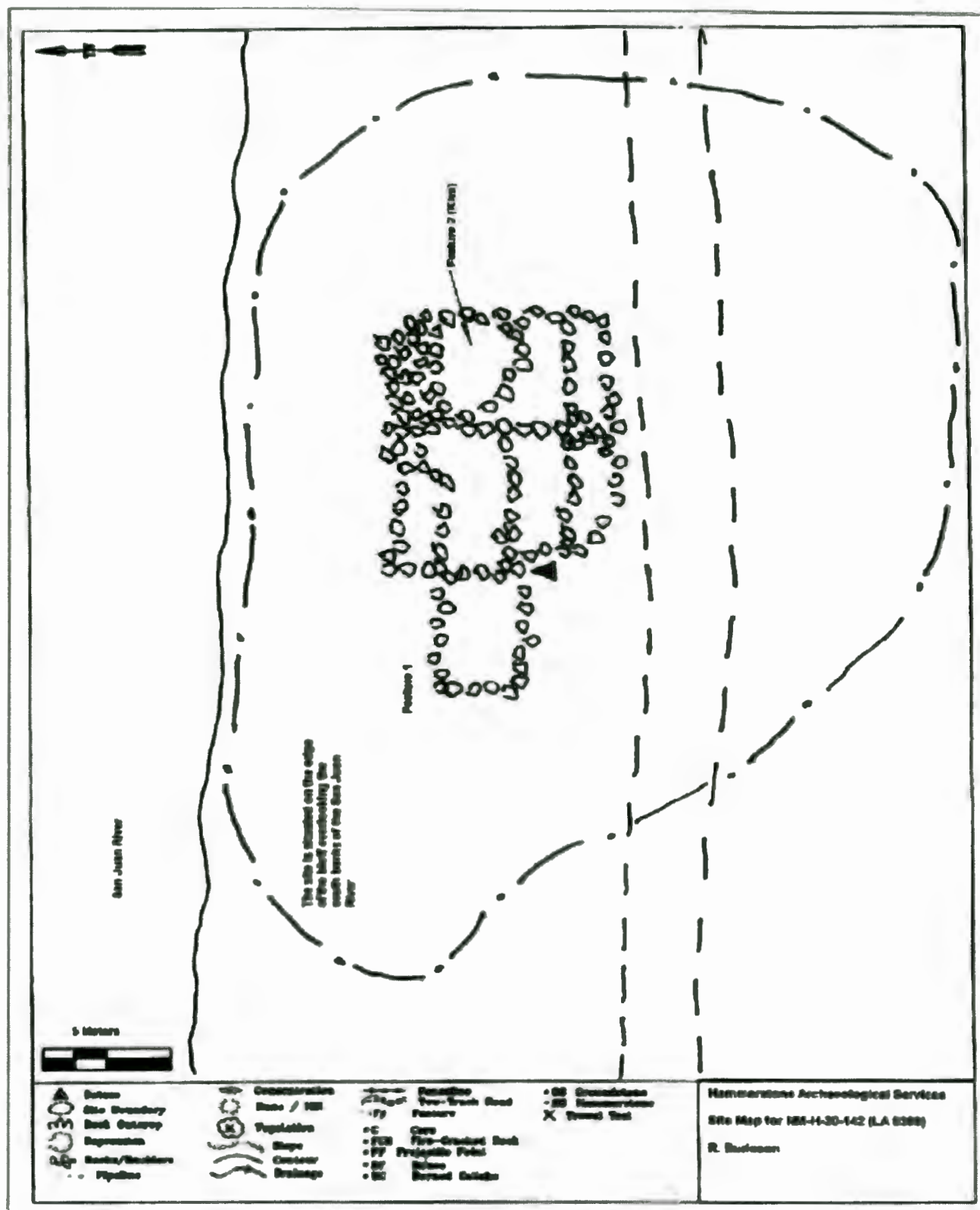
APPENDIX A: Maps and Site Photos



Appendix A Map 4. Site map for NM-H-20-140.

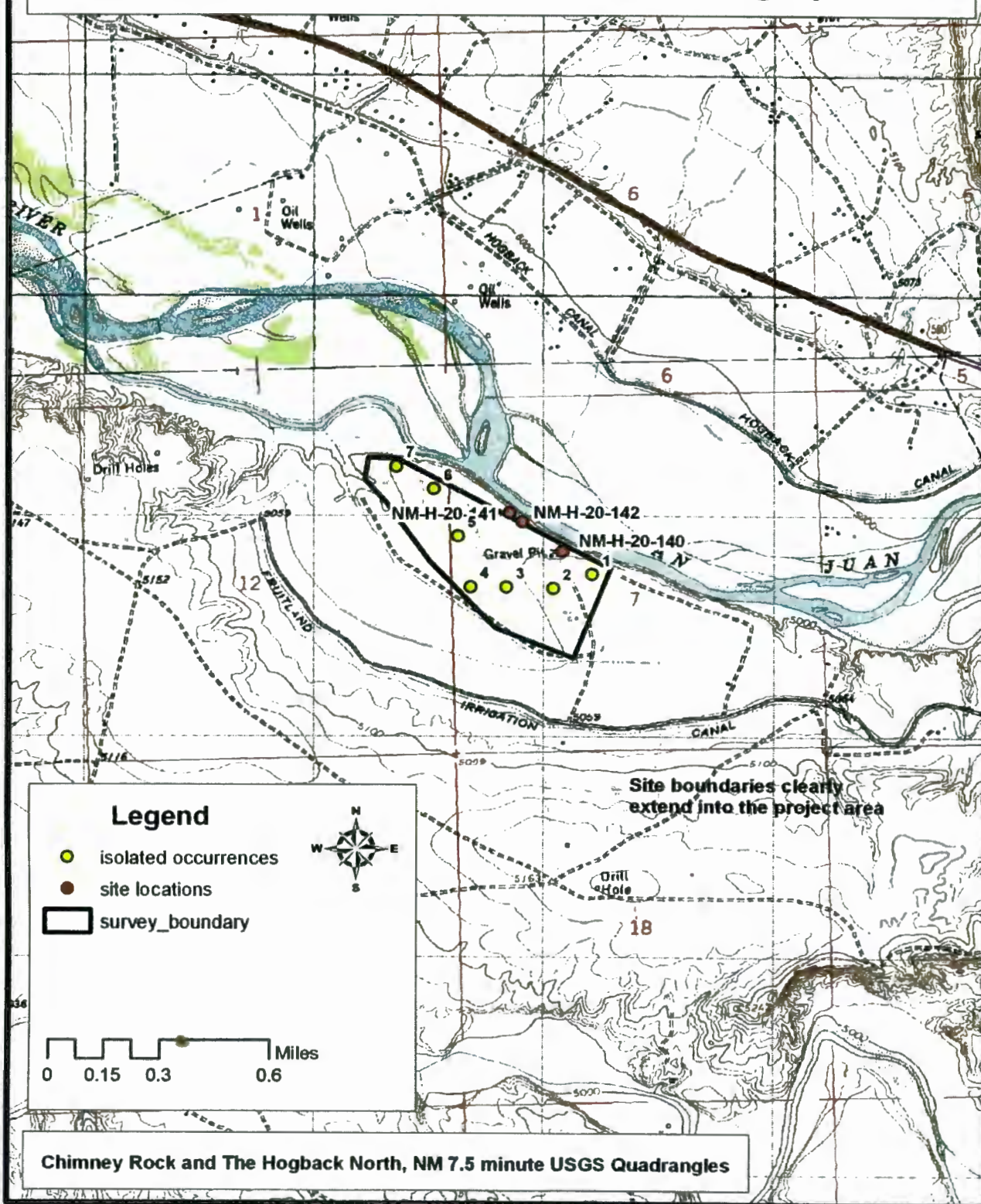


Appendix A Map 3. Site map for NM-H-20-141.



Appendix A Map 4. Site map for NM-H-20-142.

Survey of 105.67 Acres for Proposed Mining Operations





Appendix A Photo 1: NM-H-20-140 site overview; aspect W.



Appendix A Photo 2: NM-H-20-140 site overview; aspect N.



Appendix A Photo 3: NM-H-20-140 Feature 1; aspect N.



Appendix A Photo 4: NM-H-20-140 Feature 1; aspect E/SE.



Appendix A Photo 5: NM-H-20-140 Feature 2; aspect W/SW.



Appendix A Photo 6: NM-H-20-141 site overview; aspect E.



Appendix A Photo 7: NM-H-20-141 site overview, aspect W.



Appendix A Photo 8: NM-H-20-141 Feature 1; aspect E.



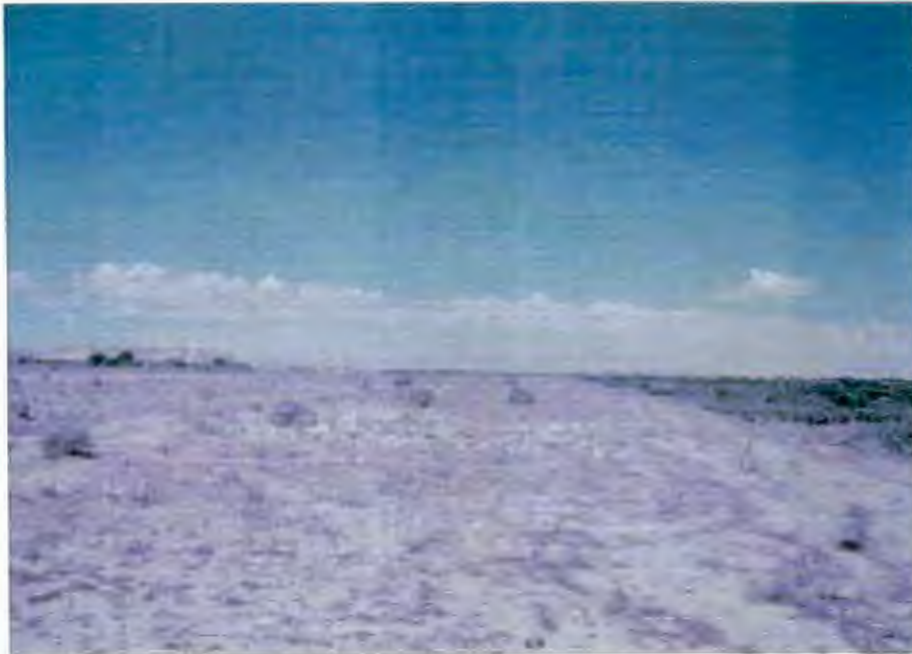
Appendix A Photo 9: NM-H-20-141 Feature 1; aspect N.



Appendix A Photo 10: NM-H-20-141 Feature 2; aspect E.



Appendix A Photo 11: NM-H-20-142 site overview; aspect E.



Appendix A Photo 12: NM-H-20-142 site overview; aspect W.



Appendix A Photo 13: NM-H-20-142 Feature 1; aspect E.



Appendix A Photo 14: NM-H-20-142 Feature 1; aspect N.



Appendix A Photo 15: NM-H-20-142 Feature 2; aspect N.



**Appendix I Navajo Nation Solid Waste Management
Program and Regulation**

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"

NAVAJO NATION
SOLID WASTE
REGULATIONS

NAVAJO NATION SOLID WASTE REGULATIONS

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NAVAJO NATION SOLID WASTE REGULATIONS

PART I - GENERAL PROVISIONS

101. TITLE.

These regulations may be cited as the “Solid Waste Regulations.”

102. AUTHORITY.

These regulations are adopted pursuant to Navajo Nation Solid Waste Act 4 N.N.C. §§ 101 et seq., as amended by Navajo Nation Council Resolution No. CJY-51-97.

103. PURPOSE.

The purpose of these regulations is to protect the health and welfare of present and future citizens of the Navajo Nation by providing for the prevention and abatement of air, land, and water pollution and other public health and environmental hazards related to solid waste management.

104. A. Applicability. These regulations apply to all persons and all owners and operators of solid waste storage, collection, transportation, processing, composting, recycling and/or disposal facilities and all persons as defined by the Navajo Nation Solid Waste Act and these regulations within the Navajo Nation.
- B. Contractors. Contracting for any aspect of solid waste management does not relieve the contractor/contractee of the responsibility for compliance with these regulations.
- C. Effective Date. Unless otherwise specified these regulations shall become effective upon approval by the Resources Committee.

105. DEFINITIONS.

- A. “Airport” means public-use airport open to the public without prior permission and without restrictions within the physical capacities of available facilities.
- B. “Aquifer” means a geologic formation, group of formations or portions of a formation capable of yielding significant quantities of ground water to wells or springs.
- C. “Bird hazard” means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants.

- D. "Closed facility" means any facility that no longer receives solid waste; and, for landfills, those closed in accordance with the applicable regulations in effect at the time of closure.
- E. "Composting" means a method of solid waste management whereby the organic component of the waste stream is biologically decomposed under controlled conditions to a state in which the end product or compost can be safely handled, stored, or applied to the land without adversely affecting human health or the environment.
- F. "Construction/demolition debris" means material from construction/demolition of a structure not water soluble and nonhazardous, including, but not limited to, steel, glass, brick, concrete, asphalt, roofing materials, pipe, gypsum wallboard and lumber. If construction/demolition debris is mixed with other wastes, whether or not originating from construction projects, it loses its classification as construction/demolition debris. Not included are asbestos, waste paints, solvents, sealers, adhesives or potentially hazardous materials.
- G. "Director" means the Executive Director of the Navajo Nation Environmental Protection Agency or his or her designee.
- H. "Disposal" means introduction of any solid waste to any environmental pathway so that such solid waste may enter the environment, be emitted into the air or discharged into surface or ground water.
- I. "Flood plain" means the lowland and relatively flat areas adjoining inland and coastal waters, including flood prone areas of offshore islands, that are inundated by the 100-year flood.
- J. "Ground water" means water below the land surface in a zone of saturation.
- K. "Health Advisor" means the Director of the Navajo Area Indian Health Service or his designee.
- L. "Hot waste" means any solid waste which is on fire or smoldering.
- M. "Household waste" means any solid waste derived from households, including single and multiple residences, hotels, motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and day-use recreation areas.
- N. "Lateral expansion" means a horizontal expansion of the waste boundaries of an existing SWLF.
- O. "Leachate" means a liquid that has passed through or emerged from solid waste

and contains soluble, suspended or miscible materials removed from such waste.

- P. “Liner” means a continuous layer of natural or man-made materials beneath and/or on the sides of a surface impoundment, landfill or landfill cell, that restricts the downward or lateral movement of solid waste, solid waste constituents or leachate.
- Q. “Liquid waste” means any waste material that is determined to contain “free liquids” as defined by Method 9095 (Paint Filter Liquids Test), as described in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Pub. No. SW-846).
- R. “Litter” means the discarding of scraps, rubbish or other waste materials on tribal trust or fee lands, but not including home-sites or other areas set aside, withdrawn or leased for private (non-public) use.
- S. “Lower Explosive Limit (LEL)” means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25°C and atmospheric pressure.
- T. “Maximum horizontal acceleration in lithified earth materials” means the maximum expected horizontal acceleration depicted on a seismic hazard map, with a 90 percent (90%) or greater probability that the acceleration will not be exceeded in two hundred and fifty (250) years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.
- U. “Modify” means to change the method or design of collection, transportation, processing, composting or disposal of solid waste from that originally permitted including horizontal expansion of the permitted boundaries of a landfill or facility.
- V. “Navajo Nation” means when referring to the government (a) the Navajo Nation government, its divisions, departments, agencies, offices, programs, branches, and employees and officials thereof, and companies, enterprises, chapters, and political subdivisions of the Navajo Nation; and when referring to its territorial jurisdiction, (b) the area defined in 7 N.N.C. § 254.
- W. “NNSWA” means the Navajo Nation Solid Waste Act.
- X. “One-hundred year flood” means a flood that has a one-percent or greater chance of recurring in any given year or a flood of a magnitude equaled or exceeded once in one hundred (100) years on the average over a significantly long period.
- Y. “Open burning” means the combustion of solid waste without:

1. Control of combustion air to maintain adequate temperature for efficient combustion.
 2. Containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion.
 3. Control of the emission of the combustion products.
- Z. “Open dump” means an excavated (trenched) area consisting of one-half (½) acre or more where solid waste is disposed and is not in compliance with the operating criteria for landfills under these regulations, but specifically does not include open scatter areas, litter areas, arroyos or trenched dumps in water ways or flood plain areas.
- AA. “Other wastes” means all waste not defined as solid waste in the NNSWA.
- BB. “Operator” means the person(s) responsible for the operation of a facility or part of a facility.
- CC. “Owner” means the person(s) who owns a facility or part of a facility.
- DD. “Person” means any individual, public or private corporation, company, partnership, firm, association, the federal government, its agencies, any state or political subdivision thereof including any city, town, village, county or municipality, or any Indian tribe, including the Navajo Nation, its divisions, departments, programs, companies, enterprises or any political subdivision of the Navajo Nation including chapter governments.
- EE. “Public water supply” means a system providing water for human consumption and other domestic uses which has at least fifteen (15) service connections, or regularly serves an average of at least twenty-five (25) individuals daily for at least sixty (60) days out of the year.
- FF. “Recycling” means any process by which recyclable materials are collected, separated, processed and reused or returned to use in the form of raw materials or products.
- GG. “Run-off” means any precipitation, leachate or other liquid that drains from the surface of a solid waste landfill facility.
- HH. “Run-on” means any precipitation, leachate or other liquid that drains onto the surface of a solid waste landfill facility.
- II. “Scavenging” means the uncontrolled removal of solid waste from a solid waste

landfill facility.

- JJ. "Seismic impact zones" means an area with a ten percent (0.10) or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in two hundred fifty (250) years.
- KK. "Sludge" means any solid, semi-solid or liquid waste generated from a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant, or any other waste having similar characteristics and effects.
- LL. "Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities, but does not include:
1. Drilling fluids, produced waters and other non-domestic wastes associated with the exploration, development or production, transportation, storage, treatment or refinement of crude oil, natural gas, carbon dioxide gas or geothermal energy;
 2. Fly ash waste, bottom ash waste, slag waste and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels and wastes produced in conjunction with the combustion of fossil fuels that are necessarily associated with the production of energy and that traditionally have been and actually are mixed with and are disposed of or treated at the same time with fly ash, bottom ash, boiler slag or flue gas emission control wastes from coal combustion;
 3. Waste from the extraction, beneficiation and processing of ores and minerals, including phosphate rock and overburden from the mining of uranium ore, coal, copper, molybdenum and other ores and minerals;
 4. Agricultural waste, including, but not limited to, manures and crop residues returned to the soil as fertilizer or soil conditioner;
 5. Cement kiln dust waste;
 6. Sand and gravel;
 7. Solid or dissolved material in domestic sewage, or solid or dissolved

materials in irrigation return flows or industrial discharges that are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, 33 U.S.C. Section 1342, or source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954, 42 U.S.C. Section 2011 et seq.;

8. Densified-refuse-derived fuel; or
 9. Any material regulated by Subtitle C or Subtitle I, 42 U.S.C. Section 6901 et seq., petroleum contaminated soils, of the federal Resource Conservation and Recovery Act of 1976, or substances regulated by the Federal Toxic Substances Control Act, 7 U.S.C. Section 136 et seq. or low-level radioactive waste.
- MM. “Solid Waste Landfill” means a discrete area of land containing an excavation (trench) consisting of at least one-half (½) acre or more that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile as those terms are defined in 40 C.F.R. § 257.2. A solid waste landfill also may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous sludge, conditionally-exempt small quantity generator waste and industrial solid waste. Such a facility may be publicly or privately owned. A solid waste landfill may be a new unit or a lateral expansion.
- NN. “Solid Waste Management Facility” means all contiguous land and structures, other appurtenances, and improvements on the land used for the disposal of solid waste.
- OO. “Storage” means the accumulation of solid waste for the purpose of processing, composting, recycling, transportation and/or disposal.
- PP. “Surface impoundment or impoundment” means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials, although it may be lined with man-made materials, which is designed to hold an accumulation of liquid waste or waste containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling, and aeration pits, ponds, or lagoons.
- QQ. “Transfer station” means a permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling or disposal facility.
- RR. “Unit boundary” means a vertical surface located at the hydraulically down-

gradient limit of a landfill unit or other solid waste disposal facility unit which is required to monitor ground water. This vertical surface extends down into the ground water.

- SS. “Uppermost aquifer” means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the property boundary of the facility.
- TT. “Variance” means an acceptable alternative that meets or exceeds the standards provided by the NNSWA and these regulations.
- UU. “Water Code” means the Navajo Nation Water Code (105.JJ.) 22 N.N.C. §§ 1101 et seq. (1984).
- VV. “Water table” means that surface in unconfined ground water at which pressure is atmospheric and is defined by levels at which water stands in wells penetrating just far enough to hold standing water.
- WW. “Wetlands” means those areas 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.
- XX. “White goods” means refrigerators, ranges, washers, water heaters, freezers and other “non-hazardous” domestic and large commercial appliances.
- YY. “Yard waste” means vegetative matter resulting from domestic landscaping, land maintenance and land clearing operations.

106. VARIANCES.

- A. The Director has the authority to grant a variance from any requirement of these regulations, provided that no variance shall be issued that will endanger the public health or harm the environment.
- B. Any owner/operator seeking a variance from any requirement of these regulations shall do so in accordance with the following procedures:
 - 1. A request for a variance shall be submitted to the Director in writing with supporting documents. The Director shall act on the request within 45 days, unless additional information is required to properly assess the request for a variance.
 - 2. The Director shall deny the variance petition unless the petitioner

establishes by clear and convincing evidence that granting the variance will not result in any significant harm to human health, safety, welfare or the environment.

3. No variance shall be granted until the Director has considered the relative interests of the owner/operator, other users of property likely to be affected and the general public.
4. Variances may be granted for an indefinite time period, provided that all variances are subject to revocation upon change circumstance indicating the variance is no longer warranted.
5. The Director shall maintain a file, open to public inspection, of all variance petitions and resulting action.
6. A filing and review fee in the amount set forth in Appendix C shall accompany the application for a variance. The Director may waive the filing and review fee for governmental entities and agencies thereof. The filing and review fee is not applicable where expressly prohibited by law.

107. SEVERABILITY.

If any part or application of these regulations is held invalid, the remainder or its application to other situations or persons shall not be affected.

108. INTERPRETATION.

The Navajo Nation Solid Waste Regulations shall be liberally construed to carry out the purpose of the Act and these regulations.

109. COMPLIANCE WITH OTHER REGULATIONS.

Compliance with these regulations does not relieve a person of the obligation to comply with other applicable Navajo Nation and federal laws and regulations.

PART II - PROHIBITED ACTS

201. DISPOSAL.

A. No person shall:

1. Dispose of any solid waste in a manner that will harm the environment, endanger the public health, safety and welfare or create a public nuisance.
2. Dispose of any solid waste in a place other than a facility which is in compliance with these regulations and other applicable laws.
3. Dispose of any waste not defined as solid waste in a solid waste landfill facility.
4. Dispose of bulk or non-containerized liquids in a solid waste landfill facility.

B. The on site disposal of on site generated solid waste from a single family ranch, camp or farm is not prohibited where said disposal does not create a public health or environmental hazard or public nuisance.

202. PERMITS REQUIRED.

Unless otherwise specified no person shall construct, operate or modify a solid waste landfill or composting facility unless the facility has obtained a permit from the Director for the described action. A permit is not required, however, for facilities that qualify under Section 201(B).

203. OPEN BURNING.

No open burning shall be allowed at any solid waste landfill facility.

204. DISCHARGE OF POLLUTANTS INTO WATER.

Owners/operators shall not allow a discharge of pollutants to waters of the United States in violation of the Clean Water Act or any water quality management plans approved under the Clean Water Act. A demonstration of compliance may require ground water and surface water monitoring.

205. AIR CONTAMINANTS.

Owners/operators shall not allow emission of any air contaminant from the facility in excess of limits prescribed by applicable air quality regulations.

206. OPEN DUMPING.

All open dumping shall be prohibited.

PART III - INSPECTIONS AND ENFORCEMENT

301. ENFORCEMENT.

- A. Subject to available appropriations, the Director is responsible for ensuring that the NNSWA and these regulations are carried out and enforced. The Director has the authority under the NNSWA to issue citations for any violation of said Act, these regulations and any permit issued thereunder.
- B. All Navajo Nation commissioned officers are authorized, by the NNSWA, to enforce said Act and these regulations.

302. INSPECTIONS.

- A. The Director or Health Advisor has the authority to enter any solid waste disposal, collection, transfer station or composting facility for the purpose of:
 - 1. Making an inspection or investigation.
 - 2. Taking samples.
 - 3. Inspecting records.
 - 4. Conducting any study, taking corrective action, enforcing of these regulations or conducting any monitoring/testing.
- B. The Director has the authority to inspect the vehicles and equipment of any solid waste transporter (excluding noncommercial household vehicles).
- C. The owner/operator shall have the right to collect aliquot samples during activities specified in § 302 and conduct his own analysis.

PART IV - STANDARDS FOR SOLID WASTE LANDFILL FACILITIES

401. SCOPE AND EFFECTIVE DATE.

A. New, Existing and Expanded Landfills.

1. All solid waste landfills that receive waste on or after October 9, 1993 must comply with all requirements of these regulations unless otherwise specified.
2. These regulations do not apply to solid waste landfills that stopped receiving waste before October 9, 1991.
3. Solid waste landfills that receive waste after October 9, 1991, but stopped receiving waste before October 9, 1993 are exempt from all the requirements of these regulations except the final cover requirements specified in Section 406. The final cover must have been installed within six months of last receipt of wastes and the cover must be maintained pursuant to the criteria existing at the time of closure. Owners and operators who failed to complete the cover installation within the six month period are subject to all the requirements of these regulations including closure, ground water monitoring, financial assurances and post-closure care.

B. Delay of the Effective Date and Exemption for Small Solid Waste Existing Landfills.

1. The effective date of these regulations for small existing solid waste landfills and permit requirement is extended until October 9, 2005, provided said small solid waste landfills meet the following conditions:
 - a. The small solid waste landfill accepts fewer than 20 tons per day, on an average annual basis;
 - b. Exhibits no evidence of ground water contamination; and
 - c. Serves either:
 - (i) A community that experiences an annual interruption of at least three consecutive months of surface transportation that prevents access to a regional waste management facility or
 - (ii) A community that has no practicable waste management

alternative and the landfill unit is located in an area that annually receives less than or equal to 25 inches of precipitation.

2. A small landfill that qualifies for the extension in Section 401(B)(1) and ceases to accept waste by October 9, 2005, shall have until October 9, 2006 to complete the closure criteria requirements set forth at Section 406(A)(1) and (2).
3. Small new or existing solid waste landfills that meet the conditions in Section 401(B)(1) are exempt from the ground water monitoring and design requirements unless there is evidence of contamination as specified in 40 C.F.R. Part 258.1.
4. An extension of the effective compliance date for closure/cover under Section 401(B)(1) and permit requirements may be sought under the variance provision of these regulations at Section 106.

C. Alternative Solid Waste Landfill Standards. The Director may authorize alternative solid waste landfill standards to the extent consistent with 40 C.F.R. Part 258.

402. SITING.

- A. New landfills, existing landfills and modifications of landfills shall not be sited in the following areas:
1. Wetlands, watercourses, floodplains, habitats of threatened/endangered species or prime farm lands.
 2. Where depth to the seasonal high ground water table will be closer than one hundred (100) feet from the bottom of the fill.
 3. Where surface or subsurface mines are considered to be a problem as determined by the Director.
 4. Within two hundred (200) feet of a fault that has had a displacement within Holocene time unless the owner/operator demonstrates to the Director that all containment structures, including liners, leachate collection and surface water control systems are designed to resist the maximum horizontal acceleration in lithified material for the site.
 5. Historically, archaeologically or culturally significant sites, unless in compliance with the Navajo Nation Cultural Resources Protection Act,

CMY-19-88, and all other applicable tribal and federal laws.

6. Within a five (5) mile radius of any airport runway end used by turbojet or piston-type aircraft.
 7. Seismic impact zones unless the owner/operator demonstrates to the Director that all containment structures, including liners, leachate collection and surface water control systems are designed to resist maximum horizontal acceleration in lithified earth material for the site. The owner/operator must place the demonstration in the operating record and notify the Director that it has been placed in the operating record.
 8. Unstable areas defined as locations susceptible to natural or human induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill. Unstable areas can include poor foundation conditions, areas susceptible to mass movement and Karst Terranes. The owner/operator shall determine whether an area is unstable utilizing factors listed in 40 C.F.R. 258.15.
- B. Existing facilities not meeting the listed § 402 siting criteria must close by October 9, 1996, in accordance with closure and post-closure requirements set forth in §§ 406 and 407 of these regulations.

403. DESIGN.

- A. Liner. Unless otherwise specified, all solid waste landfills, including lateral expansions, shall be constructed with a composite liner. The upper component must consist of a synthetic material with a thickness of at least 60 mils (if HDPE) or 30 mils (if other suitable material); and the lower component must consist of at least two feet thickness of recompacted clay or other soil material with a permeability of no more than 1×10^{-7} cm/sec having the bottom liner sloped no less than 2% and the side liners sloped no more than 33%, except where construction and operational integrity can be demonstrated at steeper slopes, with the synthetic liner installed in direct and uniform contact with the compacted soil component.
- B. Leachate Collection System.
1. A solid waste landfill required to have liners shall also have a leachate collection system that:
 - a. Is sized according to water balance calculations or using other accepted engineering methods either of which shall be approved by the Director; and

- b. Is designed to prevent more than one foot depth of leachate at any point in the bottom of the landfill unit; and
 - c. Has a leachate treatment system, or a pretreatment system, if necessary, in the case of discharge to a municipal water treatment plant; and
 - 2. The returning of leachate to the landfill or the recirculation of leachate in the landfill may be done only in landfills that have a composite liner system.
- C. Alternative Design. The Director may approve of an alternative liner design. The design must ensure that the concentration values listed in Appendix A of this Section will not be exceeded in the uppermost aquifer at the relevant part of compliance, as specified by the Director under this Section. When approving an alternative design, the Director shall consider the following factors:
- 1. The hydrogeologic characteristics of the facility and surrounding land; and
 - 2. The climatic factors of the area; and
 - 3. The volume and physical and chemical characteristics of the leachate.
- D. Relevant Point of Compliance. The relevant point of compliance specified by the Director shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the solid waste landfill. In determining the relevant point of compliance, the Director shall consider at least the following factors:
- 1. The hydrogeologic characteristics of the facility and surrounding land;
 - 2. The volume and physical and chemical characteristics of the leachate;
 - 3. The quantity, quality, and direction, of flow of ground water;
 - 4. The proximity and withdrawal rate of the ground-water users;
 - 5. The availability of alternative drinking water supplies;
 - 6. The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water and whether the ground water is currently used or reasonably expected to be used for drinking water;

7. Public health, safety, and welfare effects; and
8. Practicable capability of the owner or operator.

E. Methane Gas Control System.

1. All solid waste landfills shall have a methane gas monitoring and control system which assures that:
 - a. The concentration of methane gas generated by the facility does not exceed twenty-five percent (25%) of the lower explosive limit (LEL) for methane in facility structures (excluding gas control or recovery system components).
 - b. The concentration of methane gas does not exceed the LEL for methane at the facility property boundary.
 - c. Monitoring type and frequency is determined by:
 - (i) Soil conditions.
 - (ii) The hydrogeologic conditions surrounding the facility.
 - (iii) The hydraulic conditions surrounding the facility.
 - (iv) The location of facility structures and property boundaries.
 - d. The minimum frequency of monitoring shall be quarterly.
2. If methane gas levels exceed the limits specified in § 403(D), the owner or operator must:
 - a. Immediately take all necessary steps to ensure protection of human health and notify the Director.
 - b. Within seven (7) days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health.
 - c. Within sixty (60) days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the Director that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.

- d. The Director may establish alternative schedules for demonstrating compliance with Subsections 403(E)(2)(b) and (c).

F. Run On/Off Control Systems. All solid waste landfills must be designed, constructed and maintained:

1. To prevent flow onto the active portion of the landfill during the peak discharge from a 25 year storm; and
2. To collect and control at least the water volume resulting from a 24 hour, 25 year storm.
3. So that runoff from the active portion of the landfill unit is handled in accordance with 40 C.F.R. § 258.27(a).

404. OPERATION.

A. General Operating Requirements.

1. All landfill owners/operators shall utilize the principles of environmental engineering to confine the solid waste to the smallest practical area and to reduce it to the smallest practical volume.
2. All solid waste landfill facility owners/operators shall:
 - a. Locate and operate the facility so that it does not create a public nuisance or potential hazard to public health, welfare or the environment and in a manner to control disease vectors and odors.
 - b. Have signs to indicate the location of the site, hours of operation, provide disposal instructions, prohibit fires, scavenging, disposal of other wastes and provide emergency telephone numbers.
 - c. Barriers must be used to prevent unauthorized access by the public and entry by large animals to the facility.
 - d. Prohibit scavenging.
 - e. Provide adequate means to prevent and extinguish fires.
 - f. Direct deposit of hot waste to a location at the facility remote from the operating area or designated by permit for such purpose. The hot waste shall be immediately spread out for cooling and extinguished if on fire. The hot waste shall not be mixed with the

solid waste stream until it reaches a temperature that will not cause combustion of solid waste material.

- g. Implement a plan including recordkeeping to inspect loads or take other steps as approved by the Director that will prevent the disposal of other wastes. The plan shall require at a minimum:
 - (i) Inspection frequency and inspection of loads suspected of containing other wastes;
 - (ii) Inspection in a designated area or at a designated point in the disposal process;
 - (iii) A training program for the facility employees in identification of other waste and;
 - (iv) Maintaining written records of all inspections, signed by the inspector.
- h. Upon discovery of receipt of other waste, record the incident and:
 - (i) Notify the Director, the transporter and the generator within 24 hours.
 - (ii) Restrict the area from public access and facility personnel not involved in the incident.
 - (iii) Assure proper cleanup, transport and disposal of the waste.
- i. Have equipment manuals, telephone, catalogs, spare parts lists and spare parts readily available at the facility.
- j. Provide and maintain in good repair access roads at the facility. Access roads shall be so designed and constructed that traffic will enter and exit the site safely, flow smoothly and will not be interrupted by inclement weather.
- k. Provide sufficient unloading areas.
- l. Have and maintain adequate first-aid supplies at the facility site.
- m. Have a safety plan to address accident prevention and emergency response.

- n. Prepare and maintain an Operation Manual of current policies and procedures. The Operation Manual shall be included as part of the permit application. A copy of the Manual shall be maintained at the site. The Operation Manual shall include all information that would enable supervisory and operating personnel and persons evaluating facility operation to determine what sequence of operation, plans, diagrams, policies, procedures and legal requirements must be followed for orderly and successful operation on a daily and yearly basis.
- o. Operate in compliance with all other relevant Navajo Nation and federal regulations.

B. Record Keeping and Annual Reports.

- 1. The operator of a facility shall make and maintain on-site an operational record for each day that solid waste is received, processed or disposed and each day that construction, monitoring, closure or post-closure activity occurs.
- 2. The daily operational record shall include:
 - a. The quantity of solid waste received.
 - b. The origin of the solid waste.
 - c. The transporters of the solid waste.
 - d. The location, depth and quantity of waste in the particular grid location of the area currently being used for disposal. The location and total quantity of all waste must be recorded on a map or diagram of each cell or disposal area. Map or diagram scale shall be one inch equals one hundred feet (1" = 100').
 - e. A description of waste handling problems, emergency activities and resulting remediation.
 - f. A record of approved deviations from the originally permitted design or operational plans.
- 3. Owners/operators shall submit annual reports to the Director within forty five (45) days of the end of the calendar year on a form supplied by the Director. The report shall include:

- a. The quantity of solid waste received in each month.
 - b. A topographic survey map of the same scale, contour interval and grid system as the original site plans showing the following:
 - (i) The contours at the beginning and end of the year.
 - (ii) The location of ground water monitoring wells, access roads and facility structures.
 - (iii) The completed areas of the site as well as areas partially filled but not active in the previous year.
 - (iv) Property lines and boundaries of permitted fill areas and boundaries of lined areas.
 - c. A description of the capacity used in the previous year and the remaining permitted capacity.
 - d. A description of the acreage used for disposal, the acreage seeded, the acreage where vegetation is permanently established and a narrative of the operator's progress in implementing the closure plan.
 - e. Any change in land status or use that may affect the owner's/operator's rights and responsibilities.
 - f. A description of emergency disposal areas or methods approved by the Director and used by the owner/operator, which are not described in the permit.
 - g. Documentation and results of required ground water and methane gas monitoring programs.
 - h. A summary of the upcoming year's activities to include projected weight or volume of waste for the year, projected opening of new cells and closeout of existing cells, new projects and deviations from past operating procedures.
- 4. Owner's/operator's must place in the operation record all documentation required under these regulations to operate their facilities. The Director shall be notified that such documentation has been placed in the record.
 - 5. All records and plans required by these regulations, whether within or

outside the territorial jurisdiction of the Navajo Nation, must be furnished upon request and made available at all reasonable times for inspection by the Director.

C. Contingency Plan.

1. All owners/operators of solid waste landfill facilities must have a contingency plan for each solid waste landfill facility. The contingency plan shall be designed to minimize hazards to human health or the environment from fires, explosions or any unplanned sudden or non-sudden release of contaminants or hazardous waste constituents to air, soil, surface water or ground water.
2. The provisions of the plan shall be carried out immediately whenever there is a fire, explosion or release of contaminants or hazardous waste constituents which could threaten human health or the environment.
3. The contingency plan shall:
 - a. Describe the actions facility personnel must take in response to fires, explosion or releases of contaminants or hazardous waste constituents to air, soil, surface water or ground water.
 - b. Describe arrangements agreed to by local police departments, fire departments, hospitals, contractors, state and local emergency response teams to coordinate emergency services.
 - c. List name, address and phone numbers (office and home) of the emergency coordinator. Where more than one person is listed, one must be named as the Lead Emergency Coordinator.
 - (i) Include a list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external) and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list and a brief outline of its capabilities.
 - (ii) Include an evacuation plan for facility personnel. The plan must describe signals to be used to begin evacuation, evacuation routes and alternate evacuation routes in cases where the primary routes could be blocked by fire or

releases of hazardous wastes.

- (iii) Include an evaluation of expected contaminants, expected media contaminated and procedures for investigation, containment and correction of remediation.
- 4. A copy of the contingency plan and all revisions to the plan must be maintained at the facility and submitted to all local police departments, fire departments, hospitals, state and local emergency response teams.
- 5. The contingency plan and all revisions to the plan must be reviewed and immediately amended if necessary, whenever:
 - a. The facility permit is revised or modified.
 - b. The plan fails in an emergency.
 - c. The facility changes design, construction, operation, maintenance or other circumstances in a way that increases the potential for fires, explosions or releases of hazardous waste constituents or changes the response necessary in an emergency.
 - d. The list of emergency coordinators changes.
 - e. The list of emergency equipment changes.
- 6. Whenever there is an imminent or actual emergency situation, the emergency coordinator or his designee must immediately:
 - a. Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel.
 - b. Notify appropriate Navajo Nation, federal and other agencies with designated response roles.
- 7. Whenever there is a release, fire or explosion, the emergency coordinator must immediately identify the character, exact source, amount and extent of any released materials. He may do this by observation or review of facility records or manifests and, if necessary, by chemical analysis. Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment may consider both the direct and indirect hazard of the release, fire or explosion.

8. If the facility stops operations in response to fire, explosion or release the emergency coordinator must monitor for leaks, pressure build up, gas generation or rupture of valves, pipes or equipment, wherever this is appropriate.
9. Immediately after an emergency, the emergency coordinator must provide for treating, storing or disposing of recovered waste or any other material that results from a release, fire or explosion at the facility at a site approved by the Director.
10. The emergency coordinator must ensure that no waste that may be incompatible with the released material is treated, stored or disposed of until cleanup procedures are complete.

D. Cover. The owner/operator shall:

1. Not excavate a closed cell except as authorized by the Director.
2. At the conclusion of each day's activity or operation, or more often as conditions may dictate, cover the fill with a six (6) inch layer of earth or other appropriate material that will provide equivalent control of disease vectors, fires, odors, blowing litter and scavenging. An alternative cover must not present a threat to the human health and the environment.
3. Provide immediate cover of dead animals.

405. GROUND WATER MONITORING.

A. Applicability.

1. The requirements in this Section apply to all Solid Waste Landfill Facilities (SWLFs), except as provided in paragraph (2) of this Subsection. The requirements of this Section do not apply to small new or existing landfills that meet the conditions specified in Section 401(B)(1) unless there is evidence of contamination as specified in 40 C.F.R. Part 258.1.
2. Ground water monitoring requirements under § 405(B) through § 405(E) of this Section may be suspended by the Director for a SWLF if the owner or operator can demonstrate that there is no potential for migration of hazardous constituents from that SWLF to the uppermost aquifer during the active life of the unit and the post-closure care period. This demonstration must be certified by a qualified ground water scientist and approved by the Director, and must be based upon:

- a. Site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport.
 - b. Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and environment.
- 3. Owners and operators of SWLFs must comply with the ground water monitoring requirements of this part according to the following schedule unless an alternative schedule is specified under paragraph (4) of this Section:
 - a. Existing SWLFs and lateral expansions less than one mile from a drinking water intake (surface or subsurface) must be in compliance with the ground water monitoring requirements specified in §§ 405(B)-405(E) by October 9, 1994.
 - b. Existing SWLFs and lateral expansions greater than one mile but less than two miles from a drinking water intake (surface or subsurface) must be in compliance with the ground water monitoring requirements specified in §§ 405(B)-405(E) by October 9, 1995.
 - c. Existing SWLFs and lateral expansions greater than two miles from a drinking water intake (surface or subsurface) must be in compliance with the ground water monitoring requirements specified in §§ 405(B)-405(E) by October 9, 1996.
 - d. New SWLFs must be in compliance with the ground water monitoring requirements specified in §§ 405(B)-405(E) before receiving waste.
- 4. The Director may specify an alternative schedule for the owners or operators of existing SWLFs and lateral expansions to comply with the ground water monitoring requirements specified in §§ 405(B)-405(E). This schedule must ensure that 50 percent of all existing SWLFs are in compliance by October 9, 1994 and all existing SWLFs are in compliance by October 9, 1996. In setting the compliance schedule, the Director must consider potential risks posed by the unit to human health and the environment. The following factors should be considered in determining potential risk:
 - a. Proximity of human and environmental receptors.

- b. Design of the SWLF.
 - c. Age of the SWLF.
 - d. The size of the SWLF.
 - e. Types and quantities of wastes disposed including sewage sludge.
 - f. Resource value of the underlying aquifer, including:
 - (i) Current and future uses;
 - (ii) Proximity and withdrawal rate of uses; and
 - (iii) Ground water quality and quantity.
5. Once established at a SWLF, ground water monitoring shall be conducted throughout the active life and post-closure care period of that SWLF as specified in § 407.
 6. For the purposes of this subpart, a qualified ground water scientist is a scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in ground water hydrology and related fields as may be demonstrated by State registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding ground water monitoring, contaminant fate and transport, and corrective-action.
 7. The Director may establish alternative schedules for demonstrating compliance with § 405(B)(4)(b), pertaining to notification of placement of certification in operating record; § 405(D)(3)(a), pertaining to notification that statistically significant increase (SSI) notice is in operating record; § 405(D)(3)(b) and (c), pertaining to an assessment monitoring program; § 405(E)(2), pertaining to sampling and analyzing Appendix B constituents; § 405(E)(4)(a), pertaining to placement of notice (Appendix B constituents detected) in record and notification of notice in record; § 405(E)(4)(b), pertaining to sampling for Appendix A and B to this part; § 405(E)(7), pertaining to notification (and placement of notice in record) of SSI above ground water protection standard; §§ 405(E)(7)(a)(iv) and 405(F)(1), pertaining to assessment of corrective measures; § 405(G)(1), pertaining to selection of remedy and notification of placement in record; § 405(H)(3)(d), pertaining to notification of placement in record (alternative corrective action measures); and § 405(H)(6), pertaining to

notification of placement in record (certification of remedy completed).

B. Ground Water Monitoring Systems.

1. A ground water monitoring system must be installed that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield ground water samples from the uppermost aquifer that:
 - a. Represent the quality of background ground water that has not been affected by leakage from a unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where:
 - (i) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; or
 - (ii) Sampling at other wells will provide an indication of background ground water quality that is as representative or more representative than that provided by the upgradient wells.
 - b. Represent the quality of ground water passing the relevant point of compliance specified by the Director under Section 403(D) or at the waste management unit boundary where program approval has not been granted. The down-gradient monitoring system must be installed at the relevant point of compliance specified by the Director under Section 403(D) or at the waste management unit boundary where program approval has not been granted that ensures detection of ground water contamination in the uppermost aquifer. When physical obstacles preclude installation of ground water monitoring wells at the relevant point of compliance at existing units, the down-gradient monitoring system may be installed at the closest practicable distance hydraulically down-gradient from the relevant point of compliance specified by the Director that ensures detection of ground water contamination in the uppermost aquifer.
2. The Director may approve a multi-unit ground water monitoring system instead of separate ground water monitoring systems for each SWLF when the facility has several units, provided the multi-unit ground water monitoring system meets the requirement of § 405(B)(1) and will be as protective of human health and the environment as individual monitoring systems for each SWLF, based on the following factors:

- a. Number, spacing, and orientation of the SWLFs.
 - b. Hydrogeologic setting.
 - c. Site history.
 - d. Engineering design of the SWLFs.
 - e. Type of waste accepted at the SWLFs.
3. Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground water samples. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the ground water.
- a. Owner or operator must notify the Director that the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices documentation has been placed in the operating record.
 - b. The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.
4. The number, spacing, and depths of monitoring systems shall be:
- a. Determined based upon site-specific technical information that must include thorough characterization of:
 - (i) Aquifer thickness, ground water flow rate, ground water flow direction including seasonal and temporal fluctuations in ground water flow; and
 - (ii) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer; including, but not limited to: thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.

- b. Certified by a qualified ground water scientist. Within 14 days of this certification, the owner or operator must notify the Director that the certification has been placed in the operating record.

C. Ground Water Sampling and Analysis Requirements.

1. The ground water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of ground water quality at the background and down-gradient wells installed in compliance with § 405(B)(1) of this part. The owner or operator must notify the Director that the sampling and analysis program documentation has been placed in the operating record and the program must include procedures and techniques for:
 - a. Sample collection.
 - b. Sample preservation and shipment.
 - c. Analytical procedures.
 - d. Chain of custody control.
 - e. Quality assurance and quality control.
2. The ground water monitoring program must include sampling and analytical methods that are appropriate for ground water sampling and that accurately measure hazardous constituents and other monitoring parameters in ground water samples. Ground water samples shall not be field-filtered prior to laboratory analysis.
3. The sampling procedures and frequency must be protective of human health and the environment.
4. Ground water elevations must be measured in each well immediately prior to purging, each time ground water is sampled. The owner or operator must determine the rate and direction of ground water flow each time ground water is sampled. Ground water elevations in wells which monitor the same waste management area must be measured within a period of time short enough to avoid temporal variations in ground water flow which could preclude accurate determination of ground water flow rate and direction.
5. The owner or operator must establish background ground water quality in

a hydraulically upgradient or background well(s) for each of the monitoring parameters or constituents required in the particular ground water monitoring program that applies to the SWLF, as determined under § 405(D)(1) or § 405(E)(1) of this part. Background ground water quality may be established at wells that are not located hydraulically upgradient from the SWLF if it meets the requirements of § 405(B)(1)(a).

6. The number of samples collected to establish ground water quality data must be consistent with the appropriate statistical procedures determined pursuant to paragraph (7) of this Subsection. The sampling procedures shall be those specified under § 405(D)(2) for detection monitoring, § 405(E)(2) and (4) for assessment monitoring, and § 405(F)(2) of corrective action.
7. The owner or operator must specify in the operating record one of the following statistical methods to be used in evaluating ground water monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each hazardous constituent in each well.
 - a. A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.
 - b. An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.
 - c. A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.
 - d. A control chart approach that gives control limits for each constituent.
 - e. Another statistical test method that meets the performance standards of § 405(C)(8). The owner or operator must place a justification for this alternative in the operating record and notify the Director of the use of this alternative test. The justification

must demonstrate that the alternative method meets the performance standards of § 405(C)(8).

8. Any statistical method chosen under § 405(C)(7) shall comply with the following performance standards, as appropriate:
 - a. The statistical method used to evaluate ground water monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.
 - b. If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground water protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.
 - c. If a control chart approach is using to evaluate ground water monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and the environment. The parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values of each constituent of concern.
 - d. If a tolerance interval or a predictional interval is used to evaluate ground water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.
 - e. The statistical method shall account for data below the limit of

detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (pql) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

- f. If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.
- 9. The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular ground water monitoring program that applies to the SWLF, as determined under §§ 405(D)(1) or 405(E)(1) of this part.
 - a. In determining whether a statistically significant increase has occurred, the owner or operator must compare the ground water quality of each parameter or constituent at each monitoring well designated pursuant to § 405(B)(1)(b) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs (7) and (8) of this Subsection.
 - b. Within a reasonable period of time after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background at each monitoring well.

D. Detection Monitoring Program.

- 1. Detection monitoring is required at SWLFs at all ground water monitoring wells defined under § 405(B)(1)(a) and (b) of this part. At a minimum, a detection monitoring program must include the monitoring for the constituents listed in Appendix A to this part.
 - a. The Director may delete any of the Appendix A monitoring parameters for a SWLF if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.
 - b. The Director may establish an alternative list of inorganic indicator parameters for a SWLF, in lieu of some or all of the heavy metals

(constituents 1-15 in Appendix A to this part), if the alternative parameters provide a reliable indication of inorganic releases from the SWLF to the ground water. In determining alternative parameters, the Director shall consider the following factors:

- (i) The types, quantities, and concentrations of constituents in wastes managed at the SWLF;
- (ii) The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the SWLF;
- (iii) The detectability of indicator parameters, waste constituents, and reaction products in the ground water; and
- (iv) The concentration or values and coefficients of variation of monitoring parameters or constituents in the ground water background.

2. The monitoring frequency for all constituents listed in Appendix A to this part, or in the alternative list approved in accordance with paragraph (1)(b) of this Subsection, shall be a least semiannual during the active life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each well (background and down-gradient) must be collected and analyzed for the Appendix A constituents, or the alternative list approved in accordance with paragraph (1)(b) of this Subsection, during the first semiannual sampling event. At least one sample from each well (background and down-gradient) must be collected and analyzed during subsequent semiannual sampling events. The Director may specify an appropriate alternative frequency for repeated sampling and analysis for Appendix A constituents, or the alternative list approved in accordance with paragraph (1)(b) of this Subsection, during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the following factors:

- a. Lithology of the aquifer and unsaturated zone.
- b. Hydraulic conductivity of the aquifer and unsaturated zone.
- c. Ground water flow rates.
- d. Minimum distance between upgradient edge of the SWLF and

down-gradient monitoring well screen (minimum distance of travel).

- e. Resource value of the aquifer.
3. If the owner or operator determines, pursuant to § 405(C)(7) of this part, that there is a statistically significant increase over background for one or more of the constituents listed in Appendix A to this part or in the alternative list approved in accordance with paragraph (1)(b) of this Subsection, at any monitoring well at the boundary specified under § 405(B)(1)(b), the owner or operator:
- a. Must, within 14 days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and notify the Director that this notice was placed in the operating record.
 - b. Must establish an assessment monitoring program meeting the requirements of § 405(E) of this part within 90 days except as provided for in paragraph (3)(c) of this Subsection.
 - c. The owner/operator may demonstrate that a source other than a SWLF caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground water quality. A report documenting this demonstration must be certified by a qualified ground water scientist and be placed in the operating record. If a successful demonstration is made and documented, the owner or operator may continue detection monitoring as specified in this Section. If, after 90 days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in § 405(E).

E. Assessment Monitoring Program.

- 1. Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the Appendix A to this part or in the alternative list approved in accordance with § 405(D)(1)(b).
- 2. Within 90 days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the ground water for all constituents identified in Appendix B to this part. A minimum of one sample from each down-gradient well must be collected

and analyzed during each sampling event. For any constituent detected in the down-gradient wells as a result of the complete Appendix B analysis, a minimum of four independent samples from each well (background and down-gradient) must be collected and analyzed to establish background for the constituents. The Director may specify an appropriate subset of wells to be sampled and analyzed for Appendix B constituents during assessment monitoring. The Director may delete any of the Appendix B monitoring parameters for a SWLF if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

3. The Director may specify an appropriate alternate frequency for repeated sampling and analysis for the full set of Appendix B constituents required by § 405(E)(2) of this part, during the active life (including closure) and post-closure care of the unit considering the following factors:
 - a. Lithology of the aquifer and unsaturated zone.
 - b. Hydraulic conductivity of the aquifer and unsaturated zone.
 - c. Ground water flow rates.
 - d. Minimum distance between upgradient edge of the SWLF and down-gradient monitoring well screen (minimum distance of travel).
 - e. Resource value of the aquifer.
 - f. Nature (fate and transport) of any constituents detected in response to this Section.
4. After obtaining the results from the initial or subsequent sampling events required in paragraph (2) of this Subsection, the owner or operator must:
 - a. Within 14 days, place a notice in the operating record identifying the Appendix B constituents that have been detected and notify the Director that this notice has been placed in the operating record.
 - b. Within 90 days, and on at least a semiannual basis thereafter, resample all wells specified by § 405(B)(1), conduct analyses for all constituents in Appendix A to this part or in the alternative list approved in accordance with § 405(D)(1)(b), and for those constituents in Appendix B to this part that are detected in response to paragraph (2) of this Subsection, and record their

concentrations in the facility operating record. At least one sample from each well (background and down-gradient) must be collected and analyzed during these sampling events. The Director may specify an alternative monitoring frequency during the active life (including closure) and the post-closure period for the constituents referred to in this paragraph. The alternative frequency for Appendix A constituents, or the alternative list approved in accordance with § 405(D)(1)(b), during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the factors specified in paragraph (3) of this Subsection.

- c. Establish background concentrations for any constituents detected pursuant to paragraph (2) or (4)(b) of this Subsection.
 - d. Establish ground water protection standards for all constituents detected pursuant to paragraph (2) or (4) of this Subsection. The ground water protection standards shall be established in accordance with paragraphs (8) or (9) of this Subsection.
- 5. If the concentrations of all Appendix B constituents are shown to be at or below background values, using the statistical procedures in § 405(C)(7), for two consecutive sampling events, the owner or operator must notify the Director of this finding and may return to detection monitoring.
 - 6. If the concentrations of any Appendix B constituents are above background values, but all concentrations are below the ground water protection standard established under paragraphs (8) or (9) of this Subsection, using the statistical procedures in §405(C)(7), the owner or operator must continue assessment monitoring in accordance with this Section.
 - 7. If one or more Appendix B constituents are detected at statistically significant levels above the ground water protection standard established under paragraphs (8) or (9) of this Subsection in any sampling event, the owner or operator must, within 14 days of this finding, place a notice in the operating record identifying the Appendix B constituents that have exceeded the ground water protection standard and notify the Director and all appropriate local government officials that the notice has been placed in the operating record. The owner or operator also:
 - a. (i) Must characterize the nature and extent of the release by installing additional monitoring wells as necessary;

- (ii) Must install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with § 405(E)(4)(b);
 - (iii) Must notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells in accordance with § 405(E)(7)(a); and
 - (iv) Must initiate an assessment of corrective measures as required by § 405(F) of this part within 90 days; or
 - b. May demonstrate that a source other than a SWLF caused the contamination, or that the SSI increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground water quality. A report documenting this demonstration must be certified by a qualified ground water scientist and placed in the operating record. If a successful demonstration is made the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to § 405(E), and may return to detection monitoring if the Appendix B constituents are at or below background as specified in § 405(E)(5). Until a successful demonstration is made, the owner or operator must comply with § 405(E)(7) including initiating an assessment of corrective measures.
8. The owner or operator must establish a ground water protection standard for each Appendix B constituent detected in the ground water. The ground water protection standard shall be:
- a. For constituents for which a maximum contaminant level (MCL) has been promulgated under Section 1412 of the Safe Drinking Water Act codified under 40 C.F.R. part 141, the MCL for the constituent.
 - b. For constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with § 405(B)(1)(a).
 - c. For constituents for which the background level is higher than the MCL identified under paragraph (8)(a) of this Subsection or health based levels identified under § 405(E)(9)(a), the background concentration.

9. The Director may establish an alternative ground water protection standard for constituents for which MCLs have not been established. These ground water protection standards shall be appropriate health based levels that satisfy the following criteria:
 - a. The level is derived in a manner consistent with Agency guidelines for assessing the health risks of environmental pollutants (51 F.R. 33992, 34006, 34014, 34028, Sept. 24, 1986).
 - b. The level is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act Good Laboratory Practice Standards (40 C.F.R. PART 792) or equivalent.
 - c. For carcinogens, the level represents a concentration associated with an excess lifetime cancer risk level (due to continuous lifetime exposure) within the 1×10^{-4} to 1×10^{-6} range.
 - d. For systemic toxicants, the level represents a concentration to which the human population (including sensitive subgroups) could be exposed to on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime. For purposes of this subpart, systemic toxicants include toxic chemicals that cause effects other than cancer or mutation.
10. In establishing ground water protection standards under paragraph (9) of this Subsection, the Director may consider the following:
 - a. Multiple contaminants in the ground water.
 - b. Exposure threats to sensitive environmental receptors.
 - c. Other site-specific exposure or potential exposure to ground water.

F. Assessment of Corrective Measures.

1. Within 90 days of finding that any of the constituents listed in Appendix B of this part have been detected at a statistically significant level exceeding the ground water protection standards defined under § 405(E)(8) or (9) of this part, the owner or operator must initiate an assessment of corrective measures. Such an assessment must be completed within a reasonable period of time.
2. The owner or operator must continue to monitor in accordance with the

assessment monitoring program as specified in § 405(E).

3. The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under § 405(G), addressing at least the following:
 - a. The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination.
 - b. The time required to begin and complete the remedy.
 - c. The costs of remedy implementation.
 - d. Permit requirements or other environment or public health requirements that may substantially affect implementation of the remedy(s).
4. The owner or operator must discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

G. Selection of Remedy.

1. Based on the results of the corrective measures assessment conducted under § 405(F), the owner or operator must select a remedy that, at a minimum, meets the standards listed in paragraph (2) of this Subsection. The owner or operator must notify the Director, within 14 days of selecting a remedy, a report describing the selected remedy has been placed in the operating record and how it meets the standards in paragraph (2) of this Subsection.
2. Remedies must:
 - a. Be protective of human health and the environment.
 - b. Attain the ground water protection standard as specified pursuant to § 405(E)(8) or (9).
 - c. Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of Appendix B constituents into the environment that may pose a threat to human health or the environment.

- d. Comply with standards for management of wastes as specified in § 405(H)(4).
3. In selecting a remedy that meets the standards of § 405(G)(2), the owner or operator shall consider the following evaluation factors:
- a. The long and short term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following:
 - (i) Magnitude of reduction of existing risks;
 - (ii) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;
 - (iii) The type and degree of long-term management required, including monitoring, operation, and maintenance;
 - (iv) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation and redisposal or containment;
 - (v) Time until full protection is achieved;
 - (vi) Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;
 - (vii) Long-term reliability of the engineering and institutional controls; and
 - (viii) Potential need for replacement of the remedy.
 - b. The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
 - (i) The extent to which the containment practices will reduce further releases; and

- (ii) The extent to which treatment technologies may be used.
 - c. The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:
 - (i) Degree of difficulty associated with constructing the technology;
 - (ii) Expected operational reliability of the technologies;
 - (iii) Need to coordinate with and obtain necessary approvals and permits from other applicable agencies;
 - (iv) Availability of necessary equipment and specialists; and
 - (v) Available capacity and location of needed treatment, storage, and disposal services.
 - d. Practicable capability of the owner or operator, including a consideration of the technical and economic capability.
 - e. The degree to which community concerns are addressed by a potential remedy(s).
4. The owner or operator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within a reasonable period of time taking into consideration the factors set forth in paragraphs (4)(a)-(h) of this Subsection. The owner or operator must consider the following factors in determining the schedule of remedial activities:
- a. Extent and nature of contamination;
 - b. Practical capabilities of remedial technologies in achieving compliance with ground water protection standards established under § 405(E)(7) or (8) and other objectives of the remedy.
 - c. Availability of treatment or disposal capacity for wastes managed during implementation of the remedy.
 - d. Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety

or ability to achieve remedial objectives.

- e. Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy.
 - f. Resource value of the aquifer including:
 - (i) Current and future uses;
 - (ii) Proximity and withdrawal rate of users;
 - (iii) Ground water quantity and quality;
 - (iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituent;
 - (v) The hydrogeologic characteristics of the facility and surrounding land;
 - (vi) Ground water removal and treatment costs; and
 - (vii) The cost and availability of alternative water supplies.
 - g. Practicable capability of the owner or operator.
 - h. Other relevant factors.
5. The Director may determine that remediation of a release of an Appendix B constituent from an SWLF is not necessary if the owner or operator demonstrates to the satisfaction of the Director that:
- a. The ground water is additionally contaminated by substances that have originated from a source other than a SWLF and those substances are present in concentrations such that cleanup of the release from the SWLF would provide no significant reduction in risk to actual or potential receptors.
 - b. The constituent(s) is present in ground water that:
 - (i) Is not currently or reasonably expected to be a source of drinking water; and
 - (ii) Is not hydraulically connected with waters to which the

hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the ground water protection standards established under § 405 (E)(8) or (9).

- c. Remediation of the release(s) is technically impracticable.
 - d. Remediation results in unacceptable cross-media impacts.
6. A determination by the Director pursuant to paragraph (5) of this Subsection shall not affect the authority of the Navajo Nation to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the ground water, to prevent exposure to the ground water, or to remediate the ground water to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

H. Implementation of the Corrective Action Program.

- 1. Based on the schedule established under § 405(G)(4) for initiation and completion or remedial activities the owner/operator must:
 - a. Establish and implement a corrective action ground water monitoring program that:
 - (i) At a minimum, meets the requirements of an assessment monitoring program under § 405(E);
 - (ii) Indicates the effectiveness of the corrective action remedy; and
 - (iii) Demonstrates compliance with ground water protection standards pursuant to paragraph (5) of this Subsection.
 - b. Implement the corrective action remedy selected under § 405(G).
 - c. Take any interim measures necessary to ensure the protection of human health and the environment. Interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to § 405(G). The following factors must be considered by an owner or operator in determining whether interim measures are necessary:

- (i) Time required to develop and implement a final remedy;
 - (ii) Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;
 - (iii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;
 - (iv) Further degradation of the ground water that may occur if remedial action is not initiated expeditiously;
 - (v) Weather conditions that may cause hazardous constituents to migrate or be released;
 - (vi) Risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and
 - (vii) Other situations that may pose threats to human health and the environment.
2. An owner or operator may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of § 405(G)(2) are not being achieved through the remedy selected. In such cases, the owner or operator must implement other methods or techniques that could practicably achieve compliance with the requirements, unless the owner or operator makes the determination under § 405(H)(3).
3. If the owner or operator determines that compliance with requirements under § 405(G)(2) cannot be practically achieved with any currently available methods, the owner or operator must:
- a. Obtain certification of a qualified ground water scientist that compliance with requirements under § 405(G)(2) cannot be practically achieved with any currently available methods.
 - b. Implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment.
 - c. Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment,

units, devices or structures that are:

- (i) Technically practicable; and
 - (ii) Consistent with the overall objective of the remedy.
 - d. Notify the Director within 14 days that a report justifying the alternative measures prior to implementing the alternative measures has been placed in the operating record.
4. All solid wastes that are managed pursuant to a remedy required under § 405(G), or an interim measure required under § 405(H)(1)(c), shall be managed in a manner:
- a. That is protective of human health and the environment.
 - b. That complies with applicable RCRA requirements.
5. Remedies selected pursuant to § 405(G) shall be considered complete when:
- a. The owner or operator complies with the ground water protection standards established under § 405(E)(8) or (9) at all points within the plume of contamination that lie beyond the ground water monitoring well system established under § 405(B)(1).
 - b. Compliance with the ground water protection standards established under § 405(E)(8) or (9) has been achieved by demonstrating that concentrations of Appendix B constituents have not exceeded the ground water protection standard(s) for a period of three consecutive years using the statistical procedures and performance standards in § 405(C)(7) or (8). The Director may specify an alternative length of time during which the owner or operator must demonstrate that concentrations of Appendix B constituents have not exceeded the ground water protection standard(s) taking into consideration:
 - (i) Extent and concentration of the release(s);
 - (ii) Behavior characteristics of the hazardous constituents in the ground water;
 - (iii) Accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental

variabilities that may affect the accuracy; and

(iv) Characteristics of the ground water.

c. All actions required to complete the remedy have been satisfied.

6. Upon completion of the remedy, the owner or operator must notify the Director within 14 days that a certification that the remedy has been completed in compliance with the requirements of § 405(H)(5) has been placed in the operating record. The certification must be signed by the owner or operator and by a qualified ground water scientist.
7. When, upon completion of the certification, the owner or operator determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (5) of this Subsection, the owner or operator shall be released from the requirements for financial assurance for corrective action under Part VI.

406. CLOSURE.

- A. Closure Criteria. Owners/operators of all solid waste landfill facilities must install a final cover designed to minimize infiltration and erosion. The final cover must be designed and constructed to:
 1. Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less, and
 2. Minimize infiltration through the closed SWLF by the use of an infiltration layer that contains a minimum 18-inches of earthen material, and
 3. Minimize erosion of the final cover by the use of an erosion layer that contains a minimum 6-inches of earthen material that is capable of sustaining native plant growth.
- B. The Director may approve an alternative final cover design that includes:
 1. An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (A)(1) and (A)(2) of this Section; and
 2. An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in paragraph (A)(3) of this Section.

- C. The owner or operator must prepare a written closure plan that describes the steps necessary to close all SWLFs at any point during their active life in accordance with the cover design requirements in § 406(A) or (B), as applicable. The closure plan, at a minimum, must include the following information:
1. A description of the final cover, designed in accordance with § 406(A) and the methods and procedures to be used to install the cover;
 2. An estimate of the largest area of the SWLF ever requiring a final cover as required under § 406(A) at any time during the active life;
 3. An estimate of the maximum inventory of wastes ever on-site over the active life of the landfill facility; and
 4. A schedule for completing all activities necessary to satisfy the closure criteria in § 406.
- D. The owner or operator must notify the Director that a closure plan has been prepared and placed in the operating record no later than the effective date of this part, or by the initial receipt of waste, whichever is later.
- E. Prior to beginning closure of each SWLF as specified in § 406(F), an owner or operator must notify the Director that a notice of the intent to close the unit has been placed in the operating record.
- F. The owner or operator must begin closure activities of each SWLF no later than 30 days after the date on which the SWLF receives the known final receipt of wastes or, if the SWLF has remaining capacity and there is a reasonable likelihood that the SWLF will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the Director if the owner or operator demonstrate that the SWLF has the capacity to receive additional wastes and the owner or operator has taken and will continue to take all steps necessary to prevent threats to human health and the environmental from the unclosed SWLF.
- G. The owner or operator of all SWLFs must complete closure activities of each SWLF in accordance with the closure plan within 180 days following the beginning of closure as specified in paragraph (F) of this Section. Extensions of the closure period may be granted by the Director if the owner or operator demonstrates that closure will, of necessity, take longer than 180 days and he has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed SWLF.
- H. Following closure of each SWLF, the owner/operator must notify the Director by

written certification signed by an independent registered professional engineer verifying that closure has been completed in accordance with the approved closure plans. The certification shall be placed in the operating record.

- I. Following landfill closure, the owner/operator must record a notation on the title/deed (and/or provide notice to the Bureau of Indian Affairs and the Navajo Land Department) to the landfill facility property and notify the Director that the notation has been recorded and a copy has been placed in the operating record.
 1. The notation on the title/deed must in perpetuity notify any potential purchaser/user of the property that:
 - a. The land has been used as a landfill facility.
 - b. Its use is restricted under § 407(C)(3).
 2. The owner or operator may request permission from the Director to remove the notation from the title/deed if all wastes are removed from the facility.

407. POST CLOSURE CARE.

- A. Post-Closure Care Requirements. Following closure the owner/operator must conduct post-closure care. Post-closure care must be conducted for thirty (30) years, except as provided under § 407(B), and consists of the following:
 1. Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover to correct effects of settlement, subsidence, erosion, or other events and preventing run-on and run-off from eroding or otherwise damaging the final cover.
 2. Maintaining and operating the leachate collection system as required under these regulations. The Director may allow the owner/operator to stop managing leachate if the owner/operator demonstrates that leachate no longer poses a threat to human health or the environment.
 3. Monitoring ground water in accordance with permit requirements and 405(A)-(H).
 4. Maintaining and operating the required methane gas monitoring system in accordance with the requirements of § 403(E).
- B. The length of the post-closure care period may be:

1. Decreased by the Director if the owner/operator demonstrates that the reduced period is sufficient to protect human health and the environment and the demonstration is approved by the Director.
 2. Increased by the Director if the Director determines that the lengthened period is necessary to protect human health and the environment.
- C. The owner/operator must prepare and place in the operating record no later than the effective date of these regulations, or by the initial receipt of waste, whichever is later, a written post-closure plan. The owner/operator must notify the Director when a post-closure plan has been prepared and placed in the operating record. The post-closure plan shall include the following information:
1. A description of monitoring and maintenance activities required in § 407(A).
 2. Name, address, telephone number and emergency contact during the post-closure period.
 3. Description of planned land uses during the post-closure period. Post-closure uses shall not disturb the integrity of the final cover, liner, other components of the containment system or the function of the monitoring systems. The Director may approve a disturbance if the owner/operator demonstrates that the disturbance will not increase the potential threat to human health or the environment.
- D. Following completion of the post-closure care period for each SWLF, the owner or operator must notify the Director by written certification, signed by an independent registered professional engineer, that post-closure care has been completed in accordance with the approved plans. The certification shall be placed in the operating record.

PART V - PERMIT REQUIREMENTS FOR SOLID WASTE LANDFILL FACILITIES

501. APPLICATION/EFFECTIVE DATE.

Unless otherwise specified, a permit is required for all solid waste landfill facilities or expansions. The effective dates are as follows:

- A. New and Expanded Solid Waste Landfills. Upon the adoption of these regulations, the owner/operator of any new solid waste landfill facility or lateral expansion of an existing facility shall:

1. Apply for a permit according to the requirements of these regulations; and
 2. Not begin construction of said facility, including lateral expansion until a permit has been granted by the Director.
- B. Existing Solid Waste Landfills. The owners/operators of existing solid waste landfill facilities are not required to have a permit, provided said facilities cease receiving waste by October 9, 1995.
- C. Corrective Actions. Permits are not required for any corrective actions whether initiated by the owner/operator, Director, the Navajo Nation or the United States Environmental Protection Agency.

502. APPLICATION PROCEDURES.

- A. Prospective applicants may request the Director to schedule a preapplication conference to discuss the proposed solid waste landfill facility and application contents before the application is filed.
- B. Any owner or operator who intends to operate a SWLF subject to the permit requirements must apply for a permit with the Director. Two copies of the application, signed by the owner or operator and received by the Director are required before permit review can begin.
- C. Applications for a permit must be completed in the form required by the Director.
- D. Filing, Permit Review and Renewal Fees.
1. A filing fee shall accompany the filing of an application for a permit. The review of the application will not begin until the filing fee is received.
 2. Review and renewal fees shall be charged at an hourly rate for the review of an application. The review fee shall be billed quarterly and shall be due and payable quarterly.
- E. All contents and materials submitted as a permit application shall become part of the approved permit and shall be part of the operating record of the solid waste landfill facility.
- F. The owner or operator of a SWLF shall apply for renewal of the facility's permit every five years.

503. APPLICATION CONTENTS.

A. General Information. Each permit application shall contain the following:

1. The name, address, telephone number and emergency telephone number of the applicant, property owner, and responsible party for the site operation;
2. A general description of the facility accompanied by facility plans and drawings signed and sealed by a Professional Engineer registered in the State of Utah, Arizona or New Mexico;
3. A legal description and proof of ownership, lease agreement, or other mechanism approved by the Director of the proposed site, latitude and longitude map coordinates of the facility's front gate, and maps of the proposed facility site including land use and zoning of the surrounding area;
4. The types of waste to be handled at the facility and area served by the facility;
5. The plan of operation, including contingency plans, to ensure compliance with ground water quality requirements;
6. The form used to record weights or volumes of wastes received.
7. An inspection schedule and inspection log;
8. The closure and post-closure plans;
9. Documentation to show that any waste water treatment facility, such as a run-off or a leachate treatment system, is being reviewed or has been reviewed by the Navajo Environmental Protection Agency - National Pollutant Discharge System Program; and
10. A financial assurance plan.
11. The following maps:
 - a. Topographic map of the landfill unit drawn to a scale of 200 feet to the inch containing five foot contour intervals where the relief exceeds 20 feet and two foot contour intervals where the relief is less than 20 feet, showing the boundaries of the landfill unit, ground water monitoring wells, landfill gas monitoring points, and borrow and fill areas; and

- b. The most recent full size U.S. Geological Survey topographic map, 7-½ minute series, if printed, or other recent topographic survey of equivalent detail of the area, showing the waste facility boundary, the property boundary, surface drainage channels, flood plains, FAA facilities, existing utilities, and structures within one-fourth mile of the facility site, and the direction of the prevailing winds.
- 12. A geohydrological assessment of the facility that addresses:
 - a. Local and regional geology and hydrology, including faults, unstable slopes and subsidence areas on site;
 - b. Evaluation of bedrock and soil types and properties, including permeability rates;
 - c. Depths to ground water or aquifers;
 - d. Direction and flow rate of ground water;
 - e. Quantity, location, and construction of any private and public wells on the site and within a 2,000 foot radius of the site;
 - f. Identification of all water rights for ground water and surface water on the site and within a 2,000 foot radius of the site;
 - g. Identification and description of all surface waters on the site and within a one-mile radius of the site;
 - h. Background ground and surface water quality assessment, and for facilities seeking expansion, identification of impacts of the existing facility upon ground and surface waters from landfill leachate discharges;
 - i. Calculation of a site water balance; and
 - j. Conceptual design of a ground water and surface water monitoring system, including proposed installation methods for these devices and where applicable, a vadose zone monitoring plan;
- 13. Engineering report, plans, specifications, and calculations that address:
 - a. How the facility will meet the location standards including documentation of any demonstration made with respect to any location standard;

- b. The basis for calculating the facility's life;
 - c. Cell design to include liner design, cover design, fill methods, elevation of final cover and bottom liner, and equipment requirements and availability;
 - d. Identification of borrow sources for daily and final cover, and for soil liners;
 - e. Interim and final leachate collection, treatment, and disposal;
 - f. Ground water monitoring well location, design, and construction;
 - g. Landfill gas control and monitoring;
 - h. Design and location of run-on and run-off control systems; and
 - i. Closure and post-closure design, construction, maintenance, and land use.
14. Closure plan to address:
- a. Closure schedule;
 - b. Capacity of site in volume and tonnage;
 - c. Final inspection by regulatory agencies; and
 - d. Identification of closure costs including cost calculations and the funding mechanism.
15. Post-closure plan to address:
- a. Site monitoring of landfill gas, ground water, and surface water;
 - b. Changes to record of title, land use, and zoning restrictions;
 - c. Maintenance activities to maintain cover and run-on and run-off systems;
 - d. Identification of post-closure costs including cost calculation and the funding mechanism; and
 - e. List the name, address, and telephone number of the person or

office to contact about the facility during the post-closure period.

504. CONDITIONS.

A. Inspections.

As a condition of obtaining a permit to operate a solid waste landfill facility, the Director or health advisor shall have the right to enter said facility to conduct inspections and take samples as provided for and/or allowed under the NNSWA or these regulations.

B. Records.

As a condition of obtaining a permit to operate a solid waste landfill facility, the Director shall have the right to enter any premises of the owner/operator where records of the solid waste landfill facility are kept or said facility to inspect records as provided for and/or allowed under the NNSWA or these regulations.

C. Consent to Jurisdiction.

As a condition of obtaining a permit to operate a solid waste landfill facility, the permittee, his agents, employees, lessees, sublessees, successors and assigns shall consent to the jurisdiction of the Navajo Nation and shall agree to abide by all laws of the Navajo Nation as required by the NNSWA.

505. AVAILABILITY OF APPLICATIONS TO THE PUBLIC.

The Director shall notify the public of and the public shall have the right to review all permit applications, renewals, modifications, and determinations, including determinations and modifications pertaining to corrective actions and to provide comments. The Director may schedule a public hearing to entertain comments related to said actions if a request for a public hearing is submitted to the Director in writing within 15 days of publication of the public notice.

506. FEES.

The permit filing, review and renewal fees shall be assessed in accordance with Appendix C. Fees collected shall be utilized solely to enhance the Resource Conservation Recovery Program of the Navajo Nation. A final determination on the permit application shall be made following administrative review and upon full payment of fees.

507. MODIFICATIONS.

The owner/operator of a permitted facility who seeks to modify such facility must obtain

a permit modification from the Director.

508. TRANSFERS.

- A. A permit may not be transferred without approval from the Director, nor shall a permit be transferred from one property to another.
- B. Application for transfer of a permit shall be made at least 60 days prior to the change of permittee.
- C. The new permittee shall:
 - 1. Assume permit requirements, all financial responsibility, disclosure statement, and public notice and hearing requirements;
 - 2. Provide adequate documentation that the operator has or shall have ownership or control of the facility for which the transfer of permit has been requested;
 - 3. Demonstrate adequate knowledge and ability to operate the facility in accordance with the permit conditions; and
 - 4. Demonstrate adequate financial assurance as required in these regulations for the operation of the facility.
- D. An application for permit transfer may be denied if the Director finds that the application has:
 - 1. Knowingly misrepresented a material fact in the application;
 - 2. Refused or failed to disclose any information requested by the Director.
 - 3. Exhibited a history of willful disregard of any tribal, state or federal environmental law; or
 - 4. Had any permit revoked or permanently suspended for cause under any tribal, state or federal environmental law.

509. REVOCATION.

A permit may be revoked by the Director for:

- A. Failure to comply with the terms or conditions of the permit.

- B. Fraud, deceit or submission of inaccurate qualification information.
- C. Violation of the code or these regulations.
- D. Permit revocation may be appealed as stipulated under Subchapter 9, Appeal Process of the NNSWA of the Navajo Nation.

**PART VI - FINANCIAL RESPONSIBILITY FOR OWNERS AND
OPERATORS OF SOLID WASTE LANDFILL FACILITIES**

601. APPLICABILITY.

The requirements of Part VI §§ 601 et seq. apply to owners/operators of all solid waste landfill facilities, except owners/operators who are state and federal governmental entities whose debts and liabilities are the debts and liabilities of a state or the United States.

602. EFFECTIVE DATE.

The effective date for the requirements under Part VI §§ 601 et seq. is April 9, 1997, provided however that the effective date for solid waste landfills that qualify for the small solid waste landfill extension under § 401(B) is October 9, 2005.

603. FINANCIAL ASSURANCES FOR OPERATIONS.

At all times during the operation of the solid waste landfill facility, the owner/operator shall carry adequate public liability insurance to cover personal and property damage claims.

604. FINANCIAL ASSURANCES FOR CLOSURE.

- A. The owner/operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to close the largest area of the facility ever requiring a final cover as required under § 406 at any time during the active life in accordance with the closure plan. The owner/operator must notify the Director that the estimate has been placed in the operating record.
1. The cost estimate must equal the cost of closing the largest area of the facility ever requiring a final cover at any time during the active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan.
 2. During the active life of the facility, the owner/operator must annually adjust the closure cost estimate for inflation.
 3. The owner/operator must increase the closure cost estimate and the amount of financial assurance provided under § 604(B) if changes to the closure plan or facility conditions increase the maximum cost of closure at any time during the remaining active life.
 4. The owner/operator may reduce the closure cost estimate and the amount

of financial assurance provided under § 604(B) if the cost estimate exceeds the maximum cost of closure at any time during the remaining life of the facility. The owner/operator must notify the Director that the justification for the reduction of the closure cost estimate and the amount of financial assurance has been placed in the operating record.

- B. The owner/operator must establish financial assurance for closure of the facility in compliance with § 607. The owner/operator must provide continuous coverage for closure until released from financial assurance requirements by demonstrating compliance with § 406(G) and (H).

605. FINANCIAL ASSURANCES FOR POST-CLOSURE CARE.

- A. The owner/operator must have a detailed written estimate, in current dollars, of the cost of hiring a third party to conduct post-closure care for the facility in compliance with the post-closure care plan in § 407. The post-closure cost estimate used to demonstrate financial assurance in § 605(B) must account for the total costs of conducting post-closure care, including annual and periodic costs as described in the post-closure plan over the entire post-closure care period. The owner/operator must notify the Director that the estimate has been placed in the operating record.
 - 1. The cost estimate for post-closure care must be based on the most expensive cost of post-closure care during the post-closure care period.
 - 2. During the active life of the facility and during the post-closure care period, the owner/operator must annually adjust the post-closure cost estimate for inflation.
 - 3. The owner/operator must increase the post-closure care cost estimate and the amount of financial assurance provided under § 605(B) if changes in the post-closure plan or facility conditions increase the maximum costs of post-closure care.
 - 4. The owner/operator may reduce the post-closure cost estimate and the amount of financial assurance provided under § 605(B) if the cost estimate exceeds the maximum costs of post-closure care remaining over the post-closure care period. The owner/operator must notify the Director that the justification for the reduction of the post-closure cost estimate and the amount of financial assurance has been placed in the operating record.
- B. The owner/operator of the facility must establish, in a manner in accordance with § 607, financial assurance for the costs of post-closure care as required under § 407. The owner/operator must provide continuous coverage for post-closure

care until released from financial assurance requirements for post-closure care by demonstrating compliance with § 407(D).

606. FINANCIAL ASSURANCES FOR CORRECTIVE ACTIONS.

- A. An owner/operator of a facility required to undertake a corrective action program under § 405 must have a detailed written estimate, in current dollars, of the cost of hiring a third party to perform the corrective action in accordance with the program required under § 405. The corrective action cost estimate must account for the total costs of corrective action activities as described in the corrective action plan for the entire corrective action period. The owner/operator must notify the Director that the estimate has been placed in the operating record.
 - 1. The owner/operator must annually adjust the estimate for inflation until the corrective action program is completed in accordance with § 405.
 - 2. The owner/operator must increase the corrective action cost estimate and the amount of financial assurance provided under § 606(B) if changes in the corrective action program or facility conditions increase the maximum costs of corrective action.
 - 3. The owner/operator may reduce the amount of the corrective action cost estimate and the amount of financial assurance provided under § 605(B) if the cost estimate exceeds the maximum remaining costs of corrective action. The owner/operator must notify the Director that the justification for the reduction of the corrective action cost estimate and the amount of financial assurance has been placed in the operating record.
- B. The owner/operator of each facility required to undertake a corrective action must establish, in a manner in accordance with § 607, financial assurance for the most recent corrective action under § 405. The owner/operator must provide continuous coverage for corrective action until released from financial assurance requirements for corrective action by demonstrating compliance with § 405(H)(6) and (7).

607. ALLOWABLE FINANCIAL ASSURANCE MECHANISMS.

- A. The mechanisms used to demonstrate financial assurance under Part VI must ensure that the funds necessary to meet the costs of closure, post-closure care, and corrective action will be available whenever they are needed. Owners/operators must choose from the options specified in § 607(A)(1) through (5).
 - 1. Trust Fund.

- a. An owner/operator may satisfy the requirements of Part VI by establishing a trust fund which conforms to the requirements of this paragraph. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal, tribal or state agency. A copy of the trust agreement must be placed in the facility's operating record.
- b. Payments into the trust fund must be made annually by the owner/operator over the term of the initial permit or over the remaining life of the facility, whichever is shorter, in the case of a trust fund for closure or post-closure care, or over one-half of the estimated length of the corrective action program in the case of corrective action. This period is referred to as the pay-in period.
- c. For a trust fund used to demonstrate financial assurance for closure and post-closure care, the first payment into the fund must be at least equal to the current cost estimate for closure or post-closure care, divided by the number of years in the pay-in period as defined in § 607(A)(1)(b). The amount of subsequent payments must be determined by the following formula:

$$\text{Next Payment} = \frac{CE \cdot CV}{Y}$$

Where CE is the current cost estimate for closure or post-closure care (updated for inflation or other changes), CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

- d. For a trust fund used to demonstrate financial assurance for corrective action, the first payment into the trust fund must be at least equal to one-half of the current cost estimate for corrective action, divided by the number of years in the corrective action pay-in period as defined in § 607(A)(1)(b). The amount of subsequent payment must be determined by the following formula:

$$\text{Next Payment} = \frac{RB \cdot CV}{Y}$$

Where RB is the most recent estimate of the required trust fund

balance for corrective action (i.e., the total costs that will be incurred during the second half of the corrective action period), CV is the current value of the trust fund, and Y is the number of years remaining on the pay-in period.

- e. The initial payment into the trust fund must be made before the initial receipt of waste or before the effective date of Part VI, (April 9, 1997) or October 9, 1997 for small SWLFs that meet the conditions in Section 401(B)(1), whichever is later, in the case of closure and post-closure care, or no later than one hundred and twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of § 405.
 - f. If the owner/operator establishes a trust fund after having used one or more alternate mechanisms specified in § 607, the initial payment into the trust fund must be at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to the specifications of this paragraph in § 607(A)(1), as applicable.
 - g. The owner/operator, or other person authorized to conduct closure, post-closure care, or corrective action activities may request reimbursement from the trustee for these expenditures. Requests for reimbursement will be granted by the trustee only if sufficient funds are remaining in the trust fund to cover the remaining costs of closure, post-closure care, or corrective action, and if justification and documentation of the cost is placed in the operating record. The owner/operator must notify the Director that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.
 - h. The trust fund may be terminated by the owner/operator only if the owner/operator substitutes alternate financial assurance as specified in § 607 or if he is no longer required to demonstrate financial responsibility in accordance with the requirements of § 604(B), § 605(B), or § 606(B).
2. Surety Bond Guaranteeing Payment or Performance.
- a. An owner/operator may demonstrate financial assurance for closure or post-closure care by obtaining a payment or performance surety bond which conforms to the requirements of this paragraph. An owner/operator may demonstrate financial

assurance for corrective action by obtaining a performance bond which conforms to the requirements of this paragraph. The bond must be effective before the initial receipt of waste or before the effective date of § 607, (April 9, 1997) or October 9, 2005 for small SWLFs that meet the conditions in Section 401(B)(1), whichever is later, in the case of closure and post-closure care, or no later than one hundred and twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of § 405. The owner/operator must notify the Director that a copy of the bond has been placed in the operating record. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

- b. The penal sum of the bond must be in an amount at least equal to the current closure, post-closure care or corrective action cost estimate, whichever is applicable, except as provided in § 607(A)(4).
- c. Under the terms of the bond, the surety will become liable on the bond obligation when the owner/operator fails to perform as guaranteed by the bond.
- d. The owner/operator must establish a standby trust fund. The standby trust fund must meet the requirements of § 607(A)(1) except the requirements for initial payment and subsequent annual payments specified in § 607(A)(1)(b), (c), (d), and (e).
- e. Payments made under the terms of the bond will be deposited by the surety directly into the standby trust fund. Payments from the trust fund must be approved by the trustee.
- f. Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner/operator and to the Director one hundred and twenty (120) days in advance of cancellation. If the surety cancels the bond, the owner/operator must obtain alternate financial assurance as specified in § 607.
- g. The owner/operator may cancel the bond only if alternate financial assurance is substituted as specified in § 607 or if the owner/operator is no longer required to demonstrate financial responsibility in accordance with § 604(B), § 605(B), or § 606(B).

3. Insurance.

- a. An owner/operator may demonstrate financial assurance for closure and post-closure care by obtaining insurance which conforms to the requirements of this paragraph. The insurance must be effective before the initial receipt of waste or before the effective date of § 607 (April 9, 1997) or October 9, 2005 for small SWLFs that meet the conditions in Section 401(B)(1), whichever is later. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more states. The owner/operator must notify the Director that a copy of the insurance policy has been placed in the operating record.
- b. The closure or post-closure care insurance policy must guarantee that funds will be available to close the facility whenever final closure occurs or to provide post-closure care for the facility whenever the post-closure care period begins, whichever is applicable. The policy must also guarantee that once closure or post-closure care begins, the insurer will be responsible for the paying out of funds to the owner/operator or other person authorized to conduct closure or post-closure care, up to an amount equal to the face amount of the policy.
- c. The insurance policy must be issued for a face amount at least equal to the current cost estimate for closure or post-closure care, whichever is applicable, except as provided in § 607(A)(1). The term "face amount" means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.
- d. An owner/operator, or any other person authorized to conduct closure or post-closure care, may receive reimbursements for closure or post-closure expenditures, whichever is applicable. Requests for reimbursement will be granted by the insurer only if the remaining value of the policy is sufficient to cover the remaining costs of closure or post-closure care, and if justification and documentation of the cost is placed in the operating record. The owner/operator must notify the Director that the documentation of the justification for reimbursement has been placed in the operating record and that reimbursement has been received.

- e. Each policy must contain a provision allowing assignment of the policy to a successor owner/operator. Such assignment may be conditional upon consent of the insurer, provided that such consent is not unreasonably refused.
 - f. The insurance policy must provide that the insurer may not cancel, terminate or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may cancel the policy by sending notice of cancellation by certified mail to the owner/operator and to the Director one hundred and twenty (120) days in advance of cancellation. If the insurer cancels the policy, the owner/operator must obtain alternate financial assurance as specified in § 607.
 - g. For insurance policies providing coverage for post-closure care, commencing on the date that liability to make payments pursuant to the policy accrues, the insurer will thereafter annually increase the face amount of the policy. Such increase must be equivalent to the face amount of the policy, less any payments made, multiplied by an amount equivalent to eighty-five percent (85%) of the most recent investment rate or of the equivalent coupon-issue yield announced by the U.S. Treasury for 26-week Treasury securities.
 - h. The owner/operator may cancel the insurance policy only if alternate financial assurance is substituted as specified in § 607 or if the owner/ operator is no longer required to demonstrate financial responsibility in accordance with the requirements of § 604(B), § 605(B), or § 606(B).
4. Use of Multiple Financial Mechanisms. An owner/operator may satisfy the requirements of § 607 by establishing more than one financial mechanism per facility. The mechanisms must be as specified in Section 607(A)(1), (2), and (3), except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current cost estimate for closure, post-closure care or corrective action, whichever is applicable. The financial test and a guarantee provided by a corporate parent, sibling, or grandparent may not be combined if the financial statements of the two firms are consolidated.
5. The language of the mechanisms listed in Section 607(A)(1), (2), and (3) must ensure that the instruments satisfy the following criteria:

- a. The financial assurance mechanisms must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action for known releases when needed.
- b. The financial assurance mechanisms must ensure that funds will be available in a timely fashion when needed.
- c. The financial assurance mechanisms must be obtained by the owner/operator by the effective date of these requirements or prior to the initial receipt of solid waste, whichever is later, in the case of closure and post-closure care, and no later than one hundred and twenty (120) days after the corrective action remedy has been selected in accordance with the requirements of § 405, until the owner/operator is released from the financial assurance requirements under § 604, § 605, and § 606.
- d. The financial assurance mechanisms must be legally valid, binding, and enforceable under tribal, state and/or federal law.

PART VII - TRANSFER STATIONS

701. SCOPE/EFFECTIVE DATE.

All solid waste transfer stations shall comply with all requirements of Part VII and other applicable parts of these regulations, effective upon adoption of these regulations.

702. PERMITS.

A permit is not required to own, operate or maintain a solid waste transfer station.

703. GENERAL OPERATING REQUIREMENTS.

- A. Part VII does not apply to those storage containers placed for individual or clusters of residences and institutional, commercial, recreational or industrial establishments that service exclusively those establishments.
- B. Each transfer station shall have accessible emergency communication for employees during operating hours.
- C. Only solid waste shall be accepted at any transfer station.
- D. Containers used shall be designed or equipped to prevent leakage and spillage.

- E. At any transfer station:
1. Containers shall be removed or emptied at least once every month or more frequently as conditions warrant.
 2. Containers shall use hinged lids or removable covers during transportation.
 3. If applicable, recyclable material shall be placed directly into appropriate containers clearly identified for that purpose.
 4. Unloading of solid waste shall be confined to as small an area as possible and in designated areas only.
 5. The operator (of any transfer station) shall be present during all hours of operation.
- F. Each transfer station site shall be cleaned daily of all litter.

PART VIII - COMPOSTING

801. SCOPE/EFFECTIVE DATE.

All solid waste landfill composting facilities or other composting facilities (excluding residential) shall comply with all requirements of Part VIII and other applicable parts of these regulations, effective upon adoption of these regulations.

802. PERMITS.

All composting facilities require a permit approved by the Director except a composting facility which occupies less than 5 acres, uses only water or an inoculant as an additive and utilizes no more than 50% manure in the final mix, and does not compost treated sewage sludge or solid waste. The permit application shall contain the following information:

- A. Detailed plans and specifications for the entire composting facility, including manufacturer's performance data for equipment.
- B. The method of measuring, shredding, mixing and proportioning input materials.
- C. A description of temperature monitoring equipment and location of all temperature and other type of monitoring points and frequency of monitoring.
- D. A description of any amendments, including quantity, quality and frequency of

use.

- E. Special precautions or procedures for operation during wind, heavy rain, snow and freezing conditions.
- F. Estimated composting time duration.
- G. For windrow systems, the windrow construction, including width, length and height.
- H. The method of aeration, including turning frequency or mechanical aeration equipment and aeration capacity.
- I. A description of the use for the compost, method for site-removal and a plan for disposal of compost not used in the expected manner.
- J. For in-vessel composting systems, a process flow diagram of the entire process, including all major equipment and flow streams.

803. GENERAL OPERATING REQUIREMENTS FOR COMPOSTING FACILITIES.

The following operational requirements apply to composting facilities:

- A. Daily operational records including temperature and quantity of material processed.
- B. All waste piles collected must be processed within two years.
- C. All materials not destined for processing must be disposed of properly.
- D. If windrowed, construction and turning frequency must be sufficient to maintain aerobic conditions and to produce a compost product in the desired time frame.
- E. The finished compost must be sufficiently stabilized so that it can be stored or applied to land without producing a public health or environmental hazard.
- F. The finished compost must contain no sharp objects.
- G. Any records pertaining to the composting facility shall be made available to the Director upon request.

804. CLOSURE AND POST-CLOSURE CARE REQUIREMENTS FOR COMPOSTING FACILITIES.

- A. Closure. Within thirty (30) calendar days of closure, all composting facilities shall:
1. Remove all windrows and in-vessel compost material.
 2. Remove or revegetate compacted compost material.
 3. Drain ponds or leachate collection systems, recontour and properly dispose of any remaining materials.
- B. Post-Closure Care. Post-closure care shall include:
1. Ground water monitoring.
 2. Inspection and maintenance of cover material.
- C. Post-Closure Care Period. The post-closure care period for composting facilities shall be thirty (30) years.
1. The Director may decrease the post-closure period if the owner/operator demonstrates that a reduced period is sufficient to protect human health and the environment.
 2. The Director may extend post closure care if the extended period is necessary to protect human health and the environment.

PART IX - COLLECTION AND TRANSPORTATION OF SOLID WASTE

901. GENERAL REQUIREMENTS.

All solid waste shall be collected, transported and stored in compliance with Part IX and other applicable provisions of these regulations.

902. TRANSPORTERS.

Any transporter shall use vehicles which have covers or enclosures to prevent solid waste from being released during collection/transportation and which are maintained in a sanitary manner. Vehicles (excluding noncommercial household vehicles) shall be in compliance with standards established by the American National Standards Institutes (ANSI Z245-1, Safety Standards for Refuse Collection Equipment). Collection and transportation shall be in accordance with U.S. Environmental Protection Agency Guidelines for Solid Waste Storage and Collection (Title 40 C.F.R. 243).

903. GENERATORS.

- A. Any person who generates solid waste shall provide containers for the solid waste except for construction/demolition waste, yard waste and white goods. Storage facilities shall be insect-, rodent- and leak-proof and be kept clean and sanitary. Outside containers shall:
 - 1. If manually lifted, have a maximum capacity of thirty-two (32) gallons with safe, usable handles or shall be bags which are not filled to an extent that they rupture with normal handling.
 - 2. If mechanically handled, be compatible with collection vehicles.
- B. Any person who stores yard waste, white goods or junk vehicles shall do so to prevent insect and rodent harborage, environmental and safety hazards and protect public health.

PART X - RECYCLING

1001. RESERVED

APPENDIX A

GROUND WATER QUALITY STANDARDS

<u>Chemical</u>	<u>MCL (mg/l)</u>
Arsenic	0.05
Barium	1.0
Benzene	0.005
Cadmium	0.01
Carbon tetrachloride	0.005
Chromium (hexavalent)	0.05
2,4-Dichlorophenoxy acetic acid	0.1
1,4-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
Endrin	0.0002
Fluoride	4
Lindane	0.004
Lead	0.05
Mercury	0.002
Methoxychlor	0.1
Nitrate	10
Selenium	0.01
Silver	0.05
Toxaphene	0.005
1,1,1-Trichloromethane	0.2
Trichloroethylene	0.005
2,4,5-Trichlorophenoxy acetic acid	0.01
Vinyl Chloride	0.002

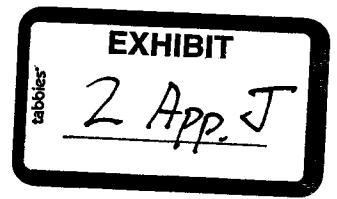
APPENDIX B

40 C.F.R. PART 258, APPENDIX II

APPENDIX C

SOLID WASTE LANDFILL FACILITY PERMIT FEES

A. Request for copies over 10 pages, per page	\$0.25
B. Solid waste regulations	\$20.00
C. Solid waste permit filing fee	\$1,000.00
D. Solid waste permit modification and renewal filing fee	\$100.00
E. Solid waste permit application and renewal review fee	\$50.00



Appendix J Relocation Plan

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"

San Juan Sand and Gravel Company, LLC.

Relocation Plan

SECTION ONE

DESCRIPTION OF THE RELOCATION PLAN

The San Juan Sand & Gravel Project is expected create or preserve jobs and employment opportunities, to improve the economic welfare of the people of the Navajo Nation and to stimulate and cause a significant development of an area that has seen nearly no economic development. This project will necessitate the displacement of a number of residents, and the San Juan Sand & Gravel Company is committed to a fair relocation program available to the persons, families, business concerns, and others residing in the San Juan Sand & Gravel mining operation areas.

This Relocation Plan is an guideline and if approved by the San Juan Chapter or by the Navajo Nation after a public hearing, constitutes the program for the relocation of persons, families, business concerns, and others to be displaced by San Juan Chapter for the San Juan Sand & Gravel Project area in accordance with Navajo Nation laws and regulations.

The basic objectives of this Relocation Plan for the San Juan Sand & Gravel Project is:

- to provide fair and equitable compensation for relocation and re-establishment costs.
- to provide relocation assistance and current market assessment services.
- to simplify the process and avoid burdensome reporting and record keeping on the part of the displaced businesses and residents.
- to provide displaced businesses and residents with a reasonable degree of flexibility.

In establishing this Relocation Plan for the San Juan Sand & Gravel Project relocation strategies were developed for the following three distinct categories of displaced persons:

- Residential Tenants
- Residential Owner-Occupants
- Businesses

SECTION TWO

SUMMARY OF ELIGIBILITY REQUIREMENTS AND BENEFITS

Residential Tenants

Benefits: One-time \$1000 payment in lieu of moving expenses, plus any difference in rent between their current apartment and the average rent for a comparable, decent, safe and sanitary replacement apartment for 12 months.

Eligibility: All residential tenants in full compliance with a valid lease/permit at the time they receive their Relocation Notification, unless they commenced their occupancy after January 13, 2014, previously agreed to waive their relocation rights, or are subject to eviction under the lease.

Residential Owner-Occupants

Benefits: In addition to the fair market value of their property, a supplemental payment for all costs necessary to purchase a comparable, decent, safe and sanitary replacement dwelling, plus all necessary, actual and reasonable moving costs, plus an alteration payment up to \$2,000 for any alterations they may choose to do to the replacement dwelling.

Eligibility: All individuals owning and occupying a property as their primary residence at the time they receive their Relocation Notification, unless they commenced their ownership or occupancy after January 13, 2014, were compensated for their relocation as a part of the purchase of their property, or previously agreed to waive their relocation rights.

Businesses

Benefits: Either (i) actual, reasonable and necessary moving expenses plus a one-time payment of up to \$2,000 for re-establishment expenses, or (ii) a one-time \$5,000 payment in lieu of moving and re-establishment expenses.

Eligibility: All businesses being operated in the San Juan Sand & Gravel Company and in full compliance with a valid lease at the time they receive their Relocation Notification, unless they commenced their business after January 13, 2014, previously agreed to waive their relocation rights, or are subject to eviction under the lease. Businesses operating under a lease that waives the tenant's right to relocation benefits in the event of condemnation will not be eligible for relocation benefits.

SECTION THREE

PROVISIONS FOR RESIDENTIAL TENANTS

3.A. Eligibility Requirements For Residential Tenants. All residential tenants in full compliance with a valid lease on any property being purchased as part of the San Juan Sand & Gravel Company. At the time they receive their Relocation Notification will receive the relocation benefits described in this Relocation Plan, unless the tenants commenced their occupancy after January 1, 2007, previously agreed to waive their relocation rights, or are subject to eviction under the lease.

3.B. Relocation Benefits For Residential Tenants. Eligible residential tenants will receive a one-time \$1000 payment in lieu of moving expenses, plus an amount equal to the difference for 12 months between the current rent the tenant is paying and the average rent for a comparable, decent, safe and sanitary apartment in the University District or surrounding area, based upon a survey conducted within one year of the date of their Relocation Notification.

Example for a two-bedroom, non-furnished apartment:

Current Rent	\$300/month
<u>Sample Average rent for a comparable unit</u>	<u>\$320/month</u>
Difference	\$ 20/month
Difference x 12 months	\$240
<u>+ Payment in Lieu of Moving Expenses</u>	<u>\$500</u>
Total Compensation	\$740

SECTION FOUR

PROVISIONS FOR RESIDENTIAL OWNER-OCCUPANTS

4.A. Eligibility Requirements For Residential Owner-Occupants. All individuals owning and occupying a property being purchased as part of the San Juan Sand & Gravel Project as their primary residence at the time they receive their Relocation Notification will receive the relocation benefits described in this Relocation Plan, unless the residential owner-occupants commenced their ownership or occupancy after January 13, 2014, were compensated for their relocation as a part of the purchase of their property, or previously agreed to waive their relocation rights.

4.B. Relocation Benefits For Residential Owner-Occupants. Eligible residential owner-occupants will receive, in addition to the fair market value of their property, a supplemental

payment for all costs necessary to purchase a comparable, decent, safe and sanitary replacement dwelling, plus all necessary, actual and reasonable moving costs, plus an alteration payment up to \$2,000 for any alterations they may choose to do to the comparable replacement dwelling.

Items eligible for the supplemental payment are all costs associated with the transfer of real estate such as, but not limited to, closing costs, surveys, title work, realtor costs, recording fees, and the actual price difference between the current dwelling and the comparable replacement dwelling.

Items eligible for the \$2,000 alteration payment are costs associated with changing the aesthetics of the comparable replacement dwelling such as, but not limited to, painting, wallpapering, lighting, carpeting, and re-decorating changes.

SECTION FIVE

PROVISIONS FOR BUSINESSES

5.A. Eligibility Requirements For Businesses. All businesses that is located within the San Juan Sand & Gravel Project area and that are in full compliance with a valid lease on a property being purchased as a part of the San Juan Sand & Gravel Project at the time the businesses receive their Relocation Notification will be eligible for relocation benefits unless the businesses commenced their business after January 13, 2014, previously agreed to waive their relocation rights, or are subject to eviction under the lease. Businesses operating under a lease that waives the tenant's right to relocation benefits in the event of condemnation will not be eligible for relocation benefits.

5.B. Relocation Benefits For Businesses. Eligible businesses will receive either (1) payment for actual, reasonable and necessary moving expenses plus a one-time payment for re-establishment, or (2) a one-time \$5,000 payment in lieu of payment for moving and re-establishment expenses, in accordance with the following provisions:

5.B.1. Relocation Benefits For Relocating Businesses' Moving and Re-Establishment Expenses. Eligible businesses will be entitled to receive payment for their actual, reasonable and necessary moving expenses if and when they can successfully find a new location within San Juan County. Actual, reasonable and necessary moving expenses may include the following expenses; transportation of personal property, packing, crating and unpacking of personal property; storage for a reasonable time (not to exceed three months); insurance for replacement value or personal property in connection with the move; licenses, permits or certification at the displaced site; professional services to help plan the move; re-lettering of signs and replacement of stationery made obsolete by the relocation; disconnecting, dismantling and re-installing machinery and equipment; and cost for searching for a replacement location. In addition, eligible businesses will receive a one-time re-

establishment payment of up to \$5,000 for repairs, modifications and improvements to the replacement property such as painting, replacement of worn carpet, lighting, other site preparations, and the difference in rent between their current location and the replacement location for a period of two (2) years.

5.B.2. Fixed Payment In Lieu of Non-Relocating Businesses' Moving and Re-Establishment Expenses. Eligible businesses either choosing not to relocate or being unable to find a replacement property will receive a one-time, fixed payment of \$2,000 in lieu of relocation benefits. Businesses that choose the \$5,000 fixed payment will be doing so in lieu of both the businesses' moving and re-establishment expenses.

SECTION SIX

RELOCATION NOTIFICATIONS AND

IMPLEMENTATION OF THIS RELOCATION PLAN

All displaced residential tenants, residential owner-occupants, and businesses will receive a written Relocation Notification notifying them of their relocation benefits eligibility status at least three months prior to the date they will be required to move. It will be the responsibility of San Juan Sand & Gravel Company Initiative, or its agents, to provide such Relocation Notifications, and to otherwise administer and implement this Relocation Plan.

As a part of this responsibility, San Juan Sand & Gravel Company Initiative, or its agents, will endeavor (1) to provide residential tenants eligible for relocation benefits with referrals to apartments to which the tenants may choose to move, (2) to provide residential owner-occupants eligible for relocation benefits with advisory services and referrals to comparable replacement structures, and (3) to provide businesses eligible for relocation benefits with referrals to replacement sites to which the businesses may choose to re-establish their business.

SECTION SEVEN

APPEALS PROCESS (To Be Revised)

Residential tenants, residential owner-occupants, and businesses may appeal their relocation benefits eligibility status by providing to San Juan Sand & Gravel Company Initiative a written appeal no later than 30 days after their receipt of their written Relocation Notification. Businesses choosing to receive payment for actual, reasonable and necessary moving expenses may appeal any disallowed moving expenses by providing to San Juan Sand & Gravel Company Initiative a written appeal no later than 15 days after San Juan Sand & Gravel Company Initiative's disallowance of the proposed expense.

Upon appeal, final determination of relocation benefits eligibility or disallowed moving expenses will be determined by an Appeals Board made up of one representative from each of the following entities:

- San Juan Chapter
- San Juan Navajo Nation Council Member
- San Juan Grazing Official
- San Juan Farm Board Member

7/20



Appendix K Navajo Nation EPA Confirmation Letter

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"



ENVIRONMENTAL PROTECTION AGENCY

THE NAVAJO NATION

Window Rock, Arizona 86515



JOE SHIRLEY, JR.
PRESIDENT

BENNIE SHELLEY
VICE-PRESIDENT

July 07, 2008

Lydia Lee
c/o Native Planning & Environmental Services
Post Office Box 3944
Window Rock, Arizona 86515

Dear Ms. Lee:

This response is to your 6/17/08 letter requesting comment on the development of a 105-acre tract that will be the base for a sand-and-gravel operation by Dibe Nistaa, Inc. The tract area is within San Juan Chapter of the Navajo Nation and San Juan County, New Mexico. The tract location coordinates are E½ of Section 12, Township 29 North, Range 17 West, and E½ of Section 07, Township 29 North, Township 16 West (NMPM). In addition, the tract is south of and along the San Juan River.

As a program of the Navajo Nation Environmental Protection Agency, Navajo Superfund Program (NSP) assesses releases or threatened releases of hazardous substances that may endanger public health or the environment. In the 19 years of staff performing pre-remedial activities under the federal Superfund process, NSP does not have 1) a site on the U.S. Environmental Protection Agency's (EPA) National Priorities List, or 2) a site on the EPA's Comprehensive Environmental Response, Compensation and Liability Information System database, within the tract area. Within 3,000 feet of the tract, NSP staff is not aware of a landfill that is purported to have toxic materials.

If you have further questions or comments, please feel free to contact me at (928) 871-6859.

Sincerely,

A handwritten signature in cursive script that reads "Diana J. Malone".

Diana J. Malone, Program Supervisor
Superfund Program
Waste Regulatory Compliance Department
Environmental Protection Agency
The Navajo Nation

Native Planning & Environmental Services

*P.O. Box 3944
Window Rock, Arizona 86515
Phone (928)266-8451
Nativeplanning01@yahoo.com*



June 17, 2008

The Navajo Nation Environmental Protection Agency
Rita Larsen
P.O. Box 339
Window Rock, Arizona 86515

RE: Dibe Nistaa, Inc. – Sand & Gravel Operations
Environmental Review

The Dibe Nistaa, Inc. of Shiprock, New Mexico is requesting your assistance in documenting environmental compliance in relation to the listed Acts, Executive Orders, Statutes. Dibe Nistaa, Inc. will be developing a Sand & Gravel Operations within a 105 acre tract of land situated in the Shiprock area. Enclosed is legal description map as well as quad map depicting the location of this proposed operation.

Wetland Protection [Executive Order 11990]: This project is adjacent to the San Juan River

Sole Source Aquifers (Safe Drinking Water Act): The criteria for meeting SSA designation is 1) it must supply more than 50% of a community's drinking water; and 2) it must be the only available local or regional source of drinking water. There has not been official designation of any sole source aquifers (SSA) on the Navajo Nation by the NNEPA Public Water Systems (PWSSP) or the USEPA, therefore solicit your concurrence that Dibe Nistaa is in compliance with this Act.

Clean Air Act [Sections 176(c), (d), 40 CFR 6, 51, 93]: This project is located with the boundaries of the Navajo nation and therefore subject to the jurisdiction of the Navajo Air Quality Control Program of the NNEPA for the purpose of air quality regulation. The proposed projects are located within an "attainment" area and would not require any individual NESHAP permit or notification, therefore no potential impacts to the NAAQS are anticipated. The Dibe Nistaa, Inc. is requesting documentation of compliance with this Act.

Toxic Chemicals and Radioactive Materials [HUD Notice 79-33]: This project is free of hazardous materials, contamination, toxic chemicals, gasses and radioactive substances which could affect the health or safety of occupants or conflict with the intended use of the property. The site is not within one mile of any National Priority List (NPL), Superfund sites or within 2000 feet of a (CERCLA) State hazardous materials site, or other known toxic site.

We have attached copies of the 7.5 minute quad maps for your review.



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Air Quality Bureau

Nonattainment Areas in New Mexico

2009 Ozone Nonattainment Recommendation

Governor Richardson recommended nonattainment status for the Sunland Park area of Doña Ana County for the 0.075 ppm 8-hour standard. [Click here to view that recommendation.](#)

Ozone Maintenance Area in Sunland Park

The U.S. EPA designated this area as a marginal nonattainment for ozone in July 1995. The nearby urban areas of El Paso, TX and Ciudad Juarez, Mexico are suspected of being the source of much of the air pollution in this area. Due to the revocation of the 1-hour ozone standard by EPA in 2004, Sunland Park was redesignated to maintenance status for the 8-hour ozone standard. The maintenance area is bounded by the New Mexico-Texas State line on the east, the New Mexico-Mexico International line on the south, the Range 3E-Range 2E line on the west, and the N3200 latitude line on the north. [Click here for a map.](#) [Click here to see the Sunland Park ozone maintenance plan.](#)

PM₁₀ Nonattainment Area in Anthony

The State of NM submitted the Anthony PM₁₀ SIP to the regional U.S. EPA headquarters in November 8, 1991. The nonattainment area is bounded by Anthony Quadrangle, Anthony, New Mexico - Texas. SE/4 La Mesa 15' Quadrangle, N32 00 - W106 30/7.5, Township 26S, Range 3E, Sections 35 and 36 as limited by the New Mexico/Texas State line on the south. A maintenance plan has not been developed at this time. The site is located in Doña Ana County, which submitted a Natural Events Action Plan for PM₁₀ exceedances to the U.S. EPA in December of 2000. The U.S. EPA has not redesignated the State's PM₁₀ nonattainment area at this time. The EPA has not indicated its plans to do so. [Click here for a map.](#) [Click here to see the Anthony nonattainment plan.](#)

SO₂ Maintenance Area in Grant County

This maintenance area is located at the Phelps Dodge Chino Copper Smelter in Grant County. The maintenance area is defined as a 3.5-mile radius region around the smelter. The maintenance area also includes high elevation areas within an 8-mile radius. The state submitted a State Implementation Plan (SIP) to the regional EPA headquarters in August 1978. The Bureau submitted a redesignation plan to the EPA in February of 2003. The redesignation plan was approved by EPA in September 2003. [Click here for a map.](#)

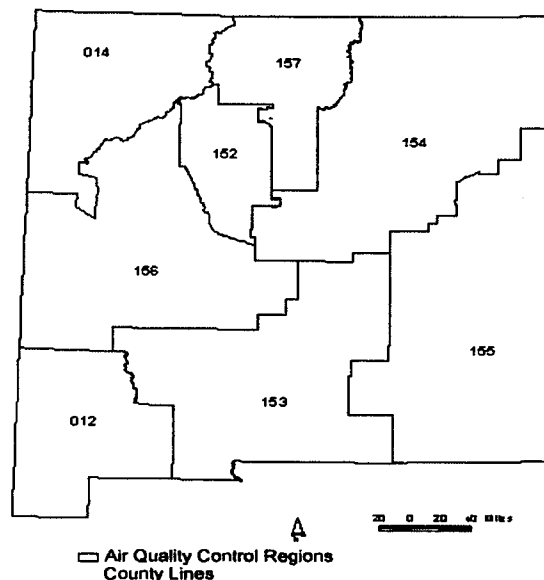
The Doña Ana County Natural Events Action Plan (NEAP) for PM₁₀

In December 2000, the Air Quality Bureau submitted a Natural Events Action Plan (NEAP) for Doña Ana County. EPA will excuse those PM₁₀ exceedances caused by uncontrollable natural events, if adequate dust control plans are in place. For Doña Ana County, getting these exceedances excused would keep the area from being designated nonattainment.

page last updated 05/06/2009

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There is no impact as a result of the development of the Dibe Niista Sand & Gravel Operations to air quality standards within New Mexico. Site is located in an area designated as meeting "Attainment". The above documentation shows the only areas within New Mexico that are considered not meeting attainment within New Mexico.



AQCR 012

Pollutant	Minor Source Baseline Date
NO ₂	August 10, 1995
SO ₂	August 10, 1995
PM ₁₀	August 10, 1995

The minor source baseline date for AQCR 012 has been set on August 10, 1995 for NO₂, SO₂ and PM₁₀.

The Arizona-New Mexico Southern Border Interstate Air Quality Control Region 012 is located in the southwestern part of the state and covers an area of 10,374 square miles. The counties within the region include Grant, Hidalgo and Luna.

The landscape in the region is one of high mountains and plains in Grant County to one of desert valleys and small, low mountain ranges in Hidalgo and Luna Counties. Elevations range from 3,800 feet above sea level in the desert valleys to 8,000 feet above sea level in the low mountain ranges. Altitudes in the higher mountain region in Grant County range to about 10,000 feet. The average annual temperature for the region is 60.4° F and the average annual precipitation ranges from 10 inches in the desert valleys and lower mountain ranges to 20 inches in the higher mountain ranges. The region is within the lower Colorado River Basin except for Luna County, which is entirely within the Southwest Closed Basin, and more than half of the Hidalgo County area is within the underground water basin.

Luna County's natural resources are very limited. Surface water is non-existent, and ground water is being used at a far greater rate than natural recharge to underground basins. Mineral resources are available, but little mining is done. The natural resources of Hidalgo County are varied. Livestock production is thriving while cultivated land is limited. Grant County has many mineral resources ranging from vast copper deposits to substantial amounts of molybdenum, zinc, lead and iron.

AQCR 014

Pollutant	Minor Source Baseline Date
NO ₂	June 6, 1989
SO ₂	October 2, 1978

PM₁₀

October 2, 1978

The minor source baseline date for AQCR 014 was established in October 2, 1978 for SO₂ and PM₁₀. The minor source baseline date was later set on June 6, 1989 for NO₂.

The New Mexico portion of the Four Corners Interstate Air Quality Control Region 014 is composed of San Juan County in its entirety, that portion of McKinley County west of the Continental Divide, that portion of Rio Arriba County lying west of the Continental Divide, all areas of the Jicarilla Apache reservation, and that portion of Valencia County lying within the Zuni and Ramah Navajo Reservation.

The total area of AQCR 014 is about 12,500 square miles. The landscape ranges from mesas and valleys to foothills and mountains. Elevations range from 4,800 feet in the Chuska Mountains along the western border between New Mexico and Arizona. Vegetation in the region includes grasslands, sagebrush, piñon and juniper as well as ponderosa pine forests in the higher elevations.

Mean monthly temperatures range from a low of 29.4° F in January to a high of 74.8° F in July. Average annual precipitation ranges from 5.6 to 10.9 inches, but is as high as 16 inches or more at higher elevations. Average wind speeds in the region are in the range of 10 miles per hour.

Natural resources in the region include extensive grazing areas for sheep and cattle, timber, and minerals including natural gas, petroleum, coal, helium and vanadium. Cultivated land is limited, while corn, dry beans, hay and apples are the major crops. Most irrigated farming occurs along the San Juan and Animas Rivers and on the Zuni Reservation. The major landuse in the region is grazing.

AQCR 152

Pollutant	Minor Source Baseline Date
NO ₂	March 26, 1997
SO ₂	May 14, 1981
PM ₁₀	None

The minor source baseline date for AQCR 152 was set on May 14, 1981 for SO₂ and March 26, 1997 for NO₂.

The Albuquerque-Mid Rio Grande Intrastate Air Quality Control Region 152 is located in central New Mexico along the north-south oriented Rio Grande Valley. It is composed of portions of Sandoval and Valencia Counties, and Bernalillo County in its entirety. The northwest corner is bounded by the Continental Divide.

The total area of AQCR 152 is about 5,000 square miles. The topography varies from mesas and arroyos to mountains. Along the eastern border of the region are the Sandia and Manzano Mountains and in the north are the Jemez and Sierra Nacimiento Mountains. Elevations range from 4,800 feet at the Rio Grande to 10,678 feet at Sandia Peak. Vegetation includes grass, sage brush, juniper, piñon and ponderosa pine forests and irrigated crops in the Rio Grande Valley.

Mean daily temperatures range from 22° F in January to 92° F in July. As in other portions of the state, there is a large 30 degree range of daily temperatures. Average annual precipitation is only eight inches, except in the mountains. This precipitation falls as a result of occasional showers, which are least frequent in the winter months. There is no regular and frequent cleansing of contaminants from the air by precipitation. Average wind speed in the region is about nine miles per hour, but the average is higher in the late winter and spring, which causes occasional dust storms. Inversions, which tend to trap pollutants at ground level, occur frequently. Inversions below 500 feet occur on slightly over 80 percent of the winter months.

Natural resources in the region include grazing areas, irrigated farmland in the river valley, timber, and some minerals such as gypsum, pumice, and sand and gravel. Geothermal resources are located in northern Sandoval County.

AQCR 153

Pollutant	Minor Source Baseline Date
NO ₂	August 2, 1995
SO ₂	None
PM ₁₀	July 12, 2000

The minor source baseline date for AQCR 153 was set on August 2, 1995 for NO₂. The minor source baseline date was set on July 12, 2000 for PM₁₀.

The New Mexico portion of the El Paso-Las Cruces-Alamogordo Interstate Air Quality Control Region 153 is composed of Doña

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New Hampshire

- Lamprey River
- Wildcat Brook

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New Jersey

- Delaware River (Lower) (See also Pennsylvania)
- Delaware River (Middle) (See also Pennsylvania) — National Park Service Site
- Great Egg Harbor River
- Maurice River
- Musconetcong River

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New Mexico

- Jemez River (East Fork)
- Pecos River
- Rio Chama — Bureau of Land Management Site
- Rio Grande — Bureau of Land Management Site

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New York

- Delaware River (Upper) (See also Pennsylvania) — National Park Service Site

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North Carolina

- Chattooga River (See also Georgia, South Carolina) — U.S. Forest Service Site, Chattooga National Park
- Horsepasture River
- New River — State of North Carolina Site
- Lumber River — State of North Carolina Site (Lumber River State Park)
- Wilson Creek

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Ohio

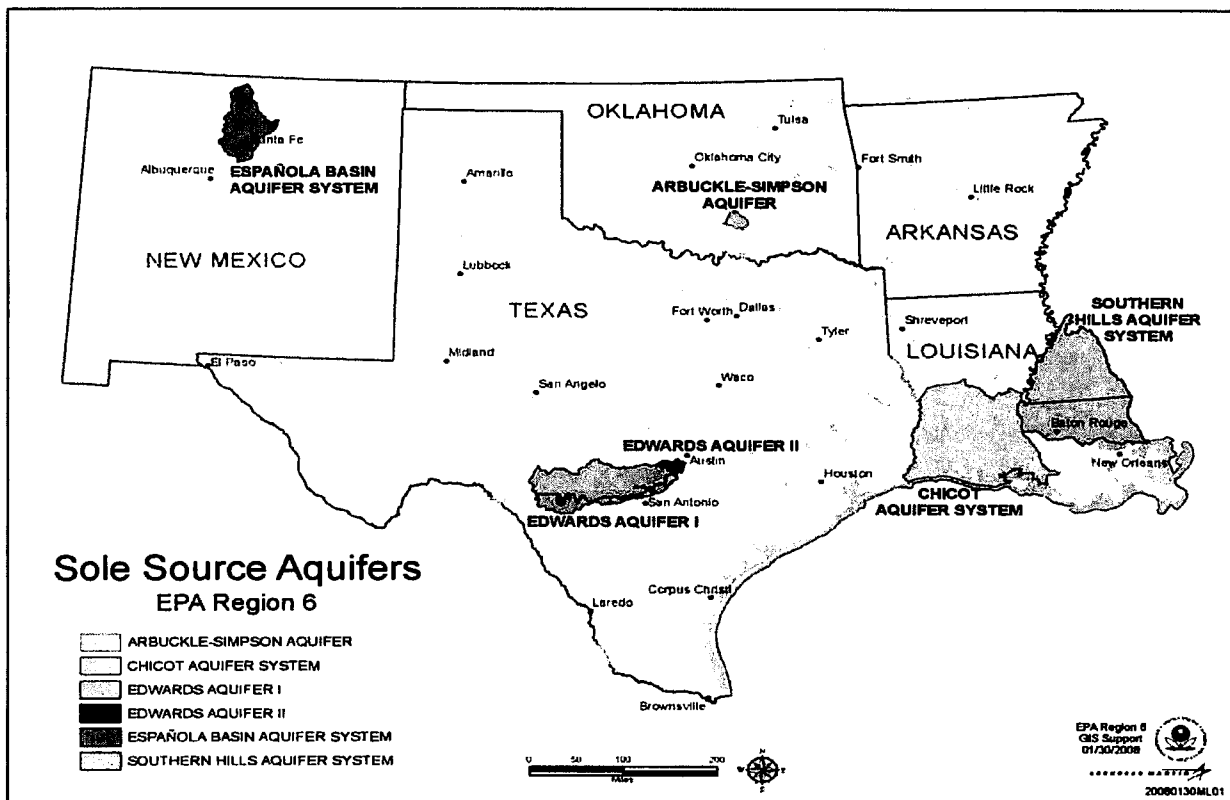
- Big and Little Darby Creeks — State of Ohio Site
- Little Beaver Creek — State of Ohio Site
- Little Miami River — State of Ohio Site

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Oregon

- Big Marsh Creek
- Chetco River — U.S. Forest Service Site
- Clackamas River
- Crescent Creek
- Crooked River — Bureau of Land Management Site
- Crooked River (North Fork)
- Deschutes River — Bureau of Land Management Site
- Donner und Blitzen River
- Eagle Creek
- Elk River — U.S. Forest Service Site
- Elkhorn Creek
- Grande Ronde, River — Bureau of Land Management Site
- Illinois River — U.S. Forest Service Site
- Innaha River
- John Day River — Bureau of Land Management Site
- John Day River (North Fork)
- John Day River (South Fork) — Bureau of Land Management Site
- Joseph Creek

There is no impact as a result of the development of the Dibe Niista Sand & Gravel Operations to "Wild & Scenic Rivers. Project site is not in vicinity of rivers shown to left.



Site location is well away from any designated sole source aquifer, as shown on above mapping of designed SSA, Espanola Basin Aquifer System. There is no impact as a result of the development of the Dibe Niista Sand & Gravel Operations.



Appendix L San Juan Sand and Gravel Emergency Action Evacuation Plan

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"

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1 Purpose

- 1.1 The Emergency Action Plan needs to be effective, workable, and practical when it comes to the safety and health of Company employees, clients and the general public. This Plan shall outline the Company Emergency Response Plan, Emergency Warning & Evacuation Plan, communications and support for various incidents. In addition the Plan shall:
 - 1.1.1 Review steps to ensure the maximum safety and security possible for our employees, subcontractors, clients and the affected property.
 - 1.1.2 Prioritize the distribution of information needed by employees, owners, emergency services, the public and news media, regulatory agencies and others with legitimate needs for information.
 - 1.1.3 Eliminate confusion, incorrect information and further loss, through effective management of the situation.

2 Authority and Scope

- 2.1 Regulation: 29 CFR 1910.38, Emergency Action Plan and 29 CFR 1910.39, Fire Prevention Plan.
- 2.2 Scope: This Plan covers Emergency Actions for all San Juan Sand and Gravel and Projects for the protection of employees, clients and the general public when applicable.

3 Plan Administration

- 3.1 The Mine Manager is San Juan Sand and Gravel, LLC, and shall be the Plan Administrator.
 - 3.1.1 Plan Administrator
 - 3.1.1.1 Ensures Response Plans are maintained and updated periodically.
 - 3.1.1.2 Ensures that Plans are communicated through regular training and reviews.
 - 3.1.1.3 Ensures that drills are conducted periodically per regulatory agency requirements and as indicated in the Pre-Job Plans.

4 Roles and Responsibilities

- 4.1 The following are procedures to be followed by employees who remain to operate critical plant operations before they evacuate.
- 4.2 **President and CEO**
 - 4.2.1 The President and/or CEO of San Juan Sand and Gravel, LLC. shall review compliance with this Plan.
 - 4.2.2 May be accomplished by discussion with the Mine Manager, San Juan Sand and Gravel, LLC, annually.
 - 4.2.3 Provide direction as appropriate depending on the nature and severity of the event.
 - 4.2.4 Designate a Public Information Officer until Company Public Information Officer assumes this role. Provide assistance in media inquiries, as needed.
- 4.3 **Chief Operating Officer/Vice-President**

- 4.3.1 The Chief Operating Officer (COO)/Vice-President shall ensure compliance with this Plan.
- 4.3.2 The COO/Vice-President shall assist as requested in identifying and mobilizing Management resources, as needed.
- 4.3.3 Establish an Emergency Operations Center for coordination of Emergency Response if necessary.

4.4 Chief Financial Officer (CFO)/Treasurer

- 4.4.1 The Chief Financial Officer (CFO)/Treasurer shall ensure compliance with this Plan.
- 4.4.2 Assist as requested in identifying and mobilizing Management resources as needed.
- 4.4.3 Resources may be Operations, Safety, Human Resources (HR), Finance, Equipment Personnel, etc.
- 4.4.4 Ensure corporate resources are responding as appropriate.
- 4.4.5 Establish an Emergency Operations Center (EOC) for coordination of Emergency Response in company location, if necessary.
- 4.4.6 Communicate with appropriate staff or their designee on needed financial support.
- 4.4.7 Establish cost codes and funding, as needed.
- 4.4.8 Ensure insurance notifications are made.
- 4.4.9 Update President/CEO, COO and other appropriate staff, as appropriate.
- 4.4.10 Work with Site Teams on finance issues, as appropriate.

4.5 Mine Manager

- 4.5.1 Be designated as Company Safety Officer, until Company Safety Officer assumes this role.
- 4.5.2 Maintain communication with appropriate staff, coordinate agency notifications and assist Site Safety Officer in starting the investigation.
- 4.5.3 Act as liaison and/or assist Company Safety Officer with agency investigations and inspections.
- 4.5.4 Assist in contacting Crisis Teams and work with HR on employee support.
- 4.5.5 Coordinate with the Company Safety Officer and Legal counsel in a formal investigation, if needed.
- 4.5.6 Act as Public Information Officer (PIO) until Company Communications Manager assumes role.
- 4.5.7 Provide status reports to Management.
- 4.5.8 Lead or assist in a formal investigation, as appropriate.

4.6 Company General Counsel/Legal Team

- 4.6.1 Direct on-site investigations and provide guidance in agency investigations and inspections.
- 4.6.2 Provide on-site legal support and lead legal aspect of the Investigation.

- 4.6.3 Ensure insurance company notifications are made as needed.
- 4.6.4 Assist Public Information Officer (PIO) in communications to media and outside resources.

4.7 Company Communications Manager

- 4.7.1 Be designated as Company Public Information Officer (PIO).
- 4.7.2 Establish and maintain direct communication with appropriate staff.

4.8 News Media/General Public Information

- 4.8.1 The primary spokesperson will be the Company Communications Manager and/or others designated by that person; in his/her absence, the Mine Manager, San Juan Sand and Gravel, LLC, will serve as spokesperson. Unless directed to do so by the above people, site personnel at all levels should refrain from making statements to news media or others in the general public.
- 4.8.2 PIO activity will include news releases, news conferences, clearing all factual statements to the news media, news media tours or other access, meetings with community groups and other interested parties in the general public.

4.9 Human Resources Manager

- 4.9.1 Communicate with Manager to determine employee needs.
- 4.9.2 Coordinate injured employee(s)'s family needs and resources with Company Safety Officer.
- 4.9.3 Assist the Company Safety Officer in on-site employee resources.
- 4.9.4 Coordinate direct on-site HR support.

4.10 Site Safety Officer

- 4.10.1 At the onset of an emergency, the Safety Officer is reporting to the Manager and is primarily responsible for ensuring the safety of the Emergency Response Team members.
- 4.10.2 The Safety Officer shall evaluate the safety hazards at the scene and determine needed emergency medical services for any injured workers. The Safety Officer will advise the Mine Manager of the safety hazards associated with the emergency. The Safety Officer may be required to provide First Aid to the injured employees or ensure First Aid providers have needed resources.
- 4.10.3 When the emergency services personnel arrive at the scene, the Safety Officer will communicate the status of all injured personnel. The Safety Officer will provide direct support as needed.
- 4.10.4 Ensuring that continuous Status Updates are provided to the Mine Manager
- 4.10.5 . Designating an appropriate person to stay with all injured employees.
- 4.10.6 Assisting with identifying any witnesses to the incident and ensuring that they provide written witness statements, as appropriate.
- 4.10.7 Ensuring that trained personnel are responding and they have enough support and supplies

5 Emergency Response to Specific Events

5.1 Medical Emergency/Mass Casualty

- 5.1.1 The most common type of emergency on a jobsite is a medical emergency from either a work-related event (slip, fall, etc.) or a non-work-related illness (heart disease, diabetes, etc.).
- 5.1.2 Each location, office or project shall have an Emergency Response Plan detailing the specific actions that each Incident/Emergency Management System (IEMS) position is responsible for performing in the event of a medical emergency.
- 5.1.3 Assignment of roles in the Incident/Emergency Management System (IEMS) and designated backup person.
- 5.1.4 How to activate the Emergency Response Plan at the location.
- 5.1.5 Locations of First Aid equipment and alternate First Aid trained employees.
- 5.1.6 Maps, routes to hospital, notification numbers and “red folder” locations.
- 5.1.7 Communication Plan to inform employees of incident and status of situation.
- 5.1.8 Plan for contacting grief counselors, if needed.

5.2 Fire/Explosion

- 5.2.1 Planning for a fire-related emergency is a required part of the overall site Emergency Response Plan.
- 5.2.2 Each location, office or project shall have an Emergency Response Plan detailing the specific actions that each IEMS position is responsible for performing in the event of a fire and explosion on the jobsite.
- 5.2.3 Some local ordinances require reporting all fires, including fires that have been put out in specified timeframes. When mobilizing, contact the local fire authority and review plans and notification requirements.
- 5.2.4 Elements of the Fire Plan shall include:
 - 5.2.4.1 Assignment of roles in the IEMS and designated backup person.
 - 5.2.4.2 How to activate the Emergency Response Plan at the location.
 - 5.2.4.3 Map or plot Plan, drawing with penciled or marked-in locations of the temporary fire extinguishers along with type and size and special hazard (e.g. Halon).
 - 5.2.4.4 Maps, routes to hospital, notification numbers and “red folder” locations.

5.3 Hazardous Materials Release

- 5.3.1 Upon arrival at a client’s facility, review the Safety Plan for the facility, if appropriate. Each facility that contains a specific quantity of hazardous materials will have a list of these materials, the quantity and location.
- 5.3.2 Hazardous materials responders are required by law to have specific training for responding to an active leak or uncontrolled release and training in clean-up operations. Contact the Company Safety Officer for additional information.
- 5.3.3 Client requests to participate in a hazardous release emergency or clean-up shall be approved by the Certified and Authorized Safety Professionals.

- 5.3.4 Employees shall have complete knowledge of potential hazardous releases, a facility Emergency Evacuation Plan, mustering sites and emergency notification systems.
- 5.3.5 Applicable individuals will have a minimum of 8 hours training or have had sufficient experience to demonstrate competency in areas of responding to releases or potential releases of hazardous substance, to protect other employees, property or the environment.
- 5.3.6 Their function is to contain the release from a safe distance and help it from spreading. Some certification is required.
- 5.3.7 Tech/Spec level requires an additional 24 hours of training, the specialist must be able to develop a site safety and control plan. Tech/Spec Certification is required.
- 5.3.8 Approved Trainers shall have the training and/or academic credentials and instructional experience to demonstrate competency.
- 5.3.9 Employees who are trained in accordance with the plan shall receive annual refresher training. A record of methods used must be kept on the project site.
- 5.3.10 Emergency response employees who exhibit signs or symptoms which may have resulted from exposure to hazardous substances during the course of an emergency shall be provided with medical consultation.
- 5.3.11 PPE shall be used in accordance with the specified plan, MSDS and DOT ERG.
- 5.3.12 Post-emergency response operations to remove hazardous substances shall be reviewed along with health hazards and materials contaminated with them (such as contaminated soil or other elements of the natural environment).
- 5.3.13 Feasible engineering controls include the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Engineering controls, work practices and PPE shall be used to reduce and maintain exposure limits.
- 5.3.14 Air monitoring should be used to identify and qualify airborne levels of hazardous substances. The monitoring should address initial entry, periodic monitoring, possible IDLH and wherever exposure may be a possibility.
- 5.3.15 A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.
- 5.3.16 All employees leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.
 - 5.3.16.1 Decontamination procedures shall be monitored by the site safety and health officer to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.
 - 5.3.16.2 Decontamination shall be performed in geographical areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

- 5.3.16.3 PPE and equipment shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness. Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove the clothing.
- 5.3.16.4 Unauthorized employees shall not remove protective clothing or equipment from change rooms.
- 5.3.16.5 Where the decontamination procedure indicates a need for regular showers and change rooms outside of a contaminated area, they shall be provided & meet the requirements of 29 CFR 1910.141.
- 5.3.17 Disposal plan shall be developed in accordance with Federal, State and Tribal Laws.

5.4 Weather-Related Incident

- 5.4.1 Sites must have a specific Weather Plan which includes:
 - 5.4.1.1 Types of hazardous weather that can be anticipated.
 - 5.4.1.2 Needed resources (such as generators, heavy equipment, emergency supplies) to maintain on site or have readily available.
 - 5.4.1.3 Personnel needs and schedules to ensure adequate support during adverse weather.
 - 5.4.1.4 Notification systems for adverse weather, which may include NOAA radios, AM/FM radio, lightning detectors if appropriate, wind speed indicators depending on location and hazard potential.
- 5.4.2 Specific components of the Weather Plan:
 - 5.4.2.1 Types of potential weather impacts to the location or project.
 - 5.4.2.2 Specific roles and additional responsibilities not included in this Procedure.
 - 5.4.2.3 Resources necessary to respond to various weather conditions.
 - 5.4.2.4 A personnel needs to support activities.
 - 5.4.2.5 Site-specific actions to be taken during various events.
 - 5.4.2.6 Site-specific emergency and evacuation plans.
 - 5.4.2.7 Communication Plan for impending storm, floods, or condition.
 - 5.4.2.8 Specific weather-related components.
 - 5.4.2.9 Severe thunderstorm and/or tornado.
 - 5.4.2.10 Hurricane.
 - 5.4.2.11 Other hazardous weather conditions.
 - 5.4.2.12 Heat- and cold-related emergencies.
- 5.4.3 Flood Threat
 - 5.4.3.1 In the event of a serious flood event the competent warning authority is the Local Emergency Authorities (LEA). When a flood is expected the LEA will be responsible for public care and safety.

- 5.4.3.2 Any advice given by competent, authorized staff on the ground will override this plan.
- 5.4.3.3 This section sets out five (5) action levels and the actions associated with each phase of the flood risk as:
 - 5.4.3.3.1 Annual Review
 - 5.4.3.3.2 Flood Watch
 - 5.4.3.3.3 Flood Warning
 - 5.4.3.3.4 Evacuate
 - 5.4.3.3.5 Return to Property
- 5.4.3.4 This information provided in this section is intended that this summary sheet is kept in a prominent location and referred to by employees in this event of the site becoming at risk of flooding.
- 5.4.3.5 All employees must review the Flood Warning and Evacuation Plan at least annually and the following actions should be taken.
 - 5.4.3.5.1 Reading the plan and updating the contact list so that employees are familiar with the required actions and contact numbers are up to date.
 - 5.4.3.5.2 Contact your local emergency authorities.
 - 5.4.3.5.3 Prepare and maintain a flood kit to contain items which are essential for evacuation. The flood kit will be also useful for general emergency situations. This should be stored where you can easily get to if flooding occurs or blacked out, and should include:
 - 5.4.3.5.3.1 A torch
 - 5.4.3.5.3.2 Blankets or sleeping bags, warm clothing and waterproofs
 - 5.4.3.5.3.3 A first-aid kit, including a supply of any essential medication
 - 5.4.3.5.3.4 A list of useful telephone numbers
 - 5.4.3.5.3.5 A supply of bottled water
 - 5.4.3.5.3.6 A stock of non-perishable food items
 - 5.4.3.5.3.7 A portable radio and supply of batteries
 - 5.4.3.5.3.8 Waterproof boots
- 5.4.3.6 Flood Watch “Issued”
 - 5.4.3.6.1 Flood Watch means –“Flooding of low lying land and roads is expected. Be aware, be prepared, and watch out!”
 - 5.4.3.6.2 The LEA authorities will issue a Flood Watch status when flooding is possible. This will be issued by website, radio, television, etc.
 - 5.4.3.6.3 When a flood watch issued, all employees should:
 - 5.4.3.6.3.1 Re-read the plan summary
 - 5.4.3.6.4 Be aware of water levels and whether the river is rising or falling.

- 5.4.3.6.5 Reconsider hauling plans
- 5.4.3.6.6 Listen to and watch for weather and flood warnings on the local radio and television stations.
- 5.4.3.6.7 Contact your local Flood line.
- 5.4.3.6.8 Check that a flood kit has been prepared.
- 5.4.3.7 Flood Warning “Issued”
 - 5.4.3.7.1 Flood Warning means – “Flooding of homes and businesses is expected. Act now!”
 - 5.4.3.7.2 All employees should consider protecting their health by following the emergency action plan.
 - 5.4.3.7.3 It is possible that when the river leaves its banks the Flood Warning alert would be triggered by the LEA, although this depends on a number of factors rather than simply the water level and may not accurately reflect the risk to homes and businesses.
 - 5.4.3.7.4 At this stage all employees should:
 - 5.4.3.7.4.1 Contact the LEA to find out whether evacuation is considered necessary and where they are providing for evacuees.
 - 5.4.3.7.4.2 Consider what is needed if evacuation to short term accommodation is necessary.
 - 5.4.3.7.4.3 Consider moving equipment to higher locations.
 - 5.4.3.7.4.4 Consider what provisions can be made for equipment.
 - 5.4.3.7.4.5 Turn off all electrical equipment.
 - 5.4.3.7.4.6 Place sandbags around fuel storage devices.
 - 5.4.3.7.5 If water levels begin to fall without reaching the site, employees should continue to monitor the situation. Employees should stay alert and be ready to evacuate until LEA issues the “All Clear” status.
- 5.4.3.8 Evacuate – Severe Flood Warning “Issued”
 - 5.4.3.8.1 Severe flood Warning means – “Severe Flooding is expected. There is extreme danger to life and property. Act now!”
 - 5.4.3.8.2 The LEA provides at least 2 hours warning between Flood Warning alert being issued and the commencement of flooding. The LEA recommends that residents and businesses should evacuate when a Flood Warning or Severe Flood Warning status is issued.
 - 5.4.3.8.3 If flood levels continue to rise, residents and businesses are advised to evacuate before the safe access is lost.
 - 5.4.3.8.4 Residents and businesses should monitor the flood progression and evacuate, preferably by vehicle as soon as possible.
 - 5.4.3.8.5 At this stage the LEA, and other services should be managing the situation, with widespread flooding potentially over a large area, and will Endeavour to provide advice o an evacuation route, shelter, and assistance to evacuees.

5.4.3.9 All Clear “Issued”

5.4.3.9.1 All Clear means – “Flood Watches or Flood Warnings are no longer in force for this area.”

5.4.3.9.2 Businesses should contact the LEA to check that it’s safe to return back to property.

5.4.3.9.3 Employees should be aware that if floodwaters entered the property, it will need to be cleaned, disinfected, repaired and fully dried out prior to reoccupation of property. All berms and slopes will need to be reevaluated and reconstructed if necessary.

5.4.3.10 The Roles of Other Bodies

5.4.3.10.1 The response to a major flood event will involve a number of organizations working together at a local level, including all LEA’s, local authorities, utilities, etc.

5.4.3.10.2 The Police Service

5.4.3.10.2.1 Coordination of the emergency services at a major flood event, as well as helping to save lives and protect property.

5.4.3.10.2.2 Establish barricades where practical to facilitate the work of the other LEA in saving lives, protecting the public and caring for the public.

5.4.3.10.3 The Fire Service

5.4.3.10.3.1 Saving life and rescuing trapped persons.

5.4.3.10.3.2 Provide monitoring procedures in respect to health and safety of those persons operating within an established barrier.

5.4.3.10.3.3 Carry out essential damage control measures, including pumping out flood water and salvage work.

5.4.3.10.3.4 Assist other relevant agencies, particularly the local authority, to minimize the effects of major flooding on the community.

5.4.3.10.4 Local Authority

5.4.3.10.4.1 Emergency care, if necessary, including feeding, accommodation and welfare for those who have been evacuated from the flooded areas.

5.4.3.10.4.2 Emergency transport for people, equipment, and materials such as; sandbags, and if necessary evacuation.

5.4.3.10.4.3 Health advice for action relating to environmental problems caused by flooding.

5.4.3.10.4.4 Coordination of the voluntary responses.

5.4.3.10.5 Utility Companies

5.4.3.10.5.1 In the event of flooding, will secure their services and equipment to ensure the continuity of supply.

5.4.3.10.5.2 Repair services disrupted by flood.

5.4.3.10.5.3 Provide alternative means of supply during service disruption if life and health risks are identified.

5.4.3.10.6 Contacts

5.4.3.10.6.1 A “floodplan checklist” will detail key individuals and contact information. It will be periodically reviewed.

5.4.3.10.6.1.1 Key Locations

5.4.3.10.6.1.2 Key Individuals

5.4.3.10.6.1.3 Protective Measures

5.4.3.10.6.1.4 Equipment and Materials

5.4.3.10.6.1.5 Assistance from other persons

5.4.3.10.7 Updating the Plan

5.4.3.10.7.1 All employees should review this plan at least annually to keep all contact numbers up to date.

5.4.3.11 Flooding Scenarios

When flooding occurs within the mine site, especially in the mining pits in the event of adverse weather conditions; the operator will follow the Scenarios and Incident Action Plan.

5.5 Security Event/Labor Dispute

5.5.1 The site Emergency Response Plan should address working with local law enforcement in the areas of prevention of losses and violence.

5.5.2 The specific elements to capture include

5.5.2.1 Roles and responsibilities.

5.5.2.2 Routes of travel for conflict avoidance.

5.5.2.3 Interaction with law enforcement.

5.5.2.4 Mustering and communication to employees and media.

5.6 Avian Flu Response

5.6.1 In the event of a national Avian Flu outbreak, the Mine Manager, San Juan Sand and Gravel, LLC, under the authority of the President and CEO, shall issue an order to halt all Company travel until the extent of the disease spread is known.

5.6.2 Sites will be contacted if in the outbreak area, and they will be provided current information and recommendations to prevent exposure as provided by the Center for Disease Control (CDC).

5.6.3 All job activities may be stopped and personnel sent home depending on the extent and severity of the outbreak.

5.6.4 Personnel not immediately affected shall secure all Company-owned information and property and prepare for evacuation.

5.6.5 Employees shall be instructed in Emergency Communication Plans and best-case estimates of time factor involved before situation stabilizes.

- 5.6.6 Depending on the location and severity, vaccines may be provided if available, appropriate and prescribed by a Licensed Healthcare Professional.
- 5.6.7 If the Corporate Office is affected, some corporate functions will be curtailed or stopped until the danger is past. Always ensure that you have enough provisions to survive if regular services begin to fail.
- 5.6.8 The Mine Manager, San Juan Sand and Gravel, LLC, shall work with Company Communications Personnel in maintaining open lines of communication during this period.

5.7 Media Response Plan

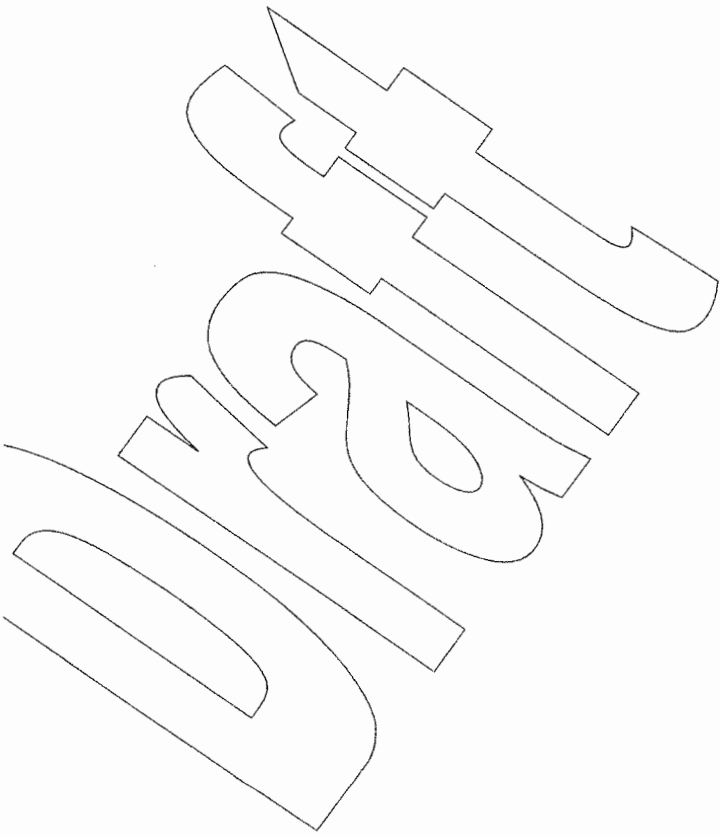
- 5.7.1 During any crisis, the Company has a desire to maintain open lines of communication with the media. Each site shall have a Communications Plan with contact numbers of local TV stations and all Company employees.
- 5.7.2 The Company Communications Manager shall ensure proper training/understanding of the Media Response Plan for Site Manager and other potential Public Information Officers.
- 5.7.3 Upon notification of a serious event or a possible media exposure, Mine Manager, San Juan Sand and Gravel, LLC, shall communicate with the Company Communications Manager.
- 5.7.4 The Company Relations Manager, or his/her designee, will refrain from making any statements about the incident to news media and will refer all media inquiries to the Company Relations Manager or his/her designee.

6 Emergency Operations Center

- 6.1 An Emergency Operations Center (EOC) is a location typically far away from the incident scene that assists in the overall coordination and Senior Management monitoring. In some circumstances, this may involve agencies that also provide support and coordination to the on-scene responders.
- 6.2 In San Juan Sand and Gravel, LLC, an EOC may be considered in the company office to monitor an incident or disaster while ensuring site teams have the needed support.
- 6.3 An EOC may be manned 24 hours or meet only periodically depending on the nature of the event.
- 6.4 Inform the appropriate Departments of the Emergency Management Plan and any extraordinary aspects of it. At a minimum, those Departments include:
 - 6.4.1 Operations;
 - 6.4.2 Personnel/Safety;
 - 6.4.3 Human Resources;
 - 6.4.4 Administration; and
 - 6.4.5 Legal, Procurement and Insurance.
- 6.5 The following are the typical flow and responsibility assignments of emergency notifications:
 - 6.5.1 The Site Manager will be responsible for assuring that all departments to be notified include:

- 6.5.1.1 Operations (notify the Head of Operations);
- 6.5.1.2 Personnel/Safety;
- 6.5.1.3 Human Resources;
- 6.5.1.4 Legal; and
- 6.5.1.5 Others as necessary.
- 6.5.2 Emergency Management Team members should be assembled and include:
 - 6.5.2.1 Mine Manager;
 - 6.5.2.2 Supervisors
 - 6.5.2.3 Safety Officer;
 - 6.5.2.4 Additional roles may be added as necessary.
 - 6.5.2.5 A Post Incident Debrief shall be conducted as appropriate.
- 6.5.3 Prepare the following information on each injured personnel:
 - 6.5.3.1 Name, address, date of birth, craft, employment history.
- 6.5.4 Discuss trauma counseling for all project personnel.
- 6.5.5 Determine if regulatory agencies must be notified:
 - 6.5.5.1 OSHA requires notification within 8 hours of an incident resulting in a fatality or where three or more workers are hospitalized.
 - 6.5.5.2 MSHA requires immediate notification when an accident occurs, which results in death or where there was a reasonable potential to cause death (15 minutes).
 - 6.5.5.3 Determine environmental impact caused by the emergency and if any notifications are required.
 - 6.5.5.4 Compile the facts related to the incident and prepare information for distribution.

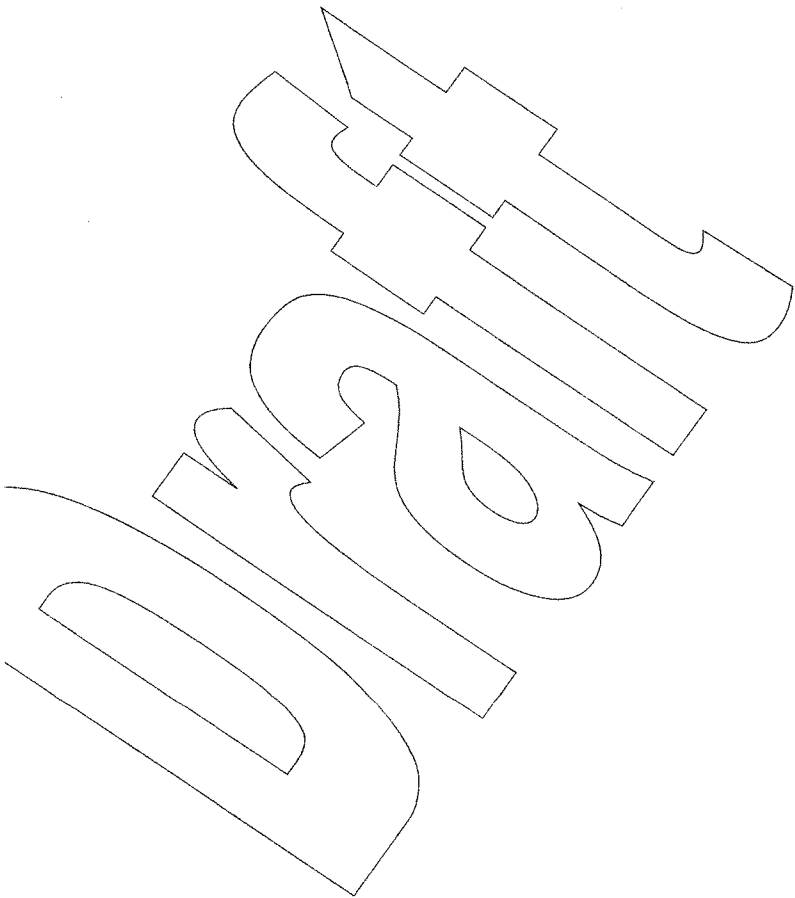
Appendix A – Statement to the Press



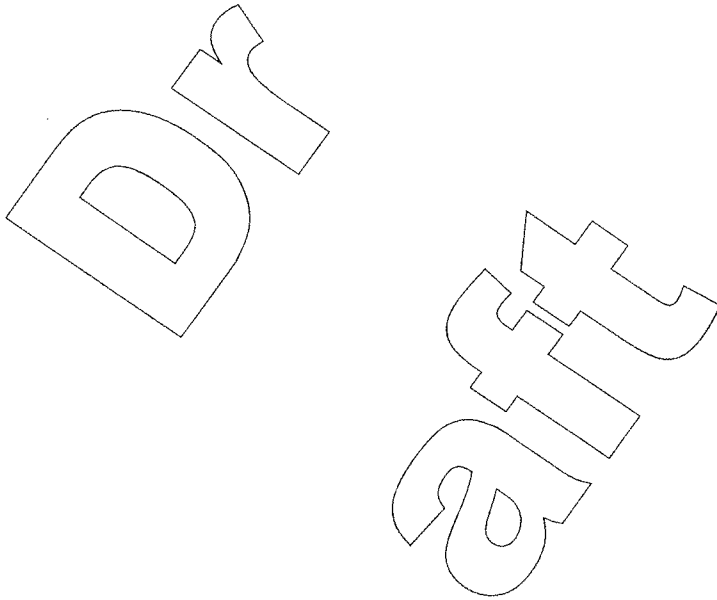
Appendix B – Emergency Planning Management Action List

16

Appendix C – Media Response Checklist



Appendix D – Communication Checklist



Appendix E –Scenarios and Incident Action Plan

I. Purpose

Most of Federal and Tribal Agencies have Training Curriculum modules that include exercises to give employees and their families an opportunity to apply these instructional modules.

Scenarios, background information, and exercise instructions have been included in the following weather scenarios modules below.

II. Scenario Categories and Listing

Scenario

A. Weather/Natural Disasters

1. Slow-Building River Flood
2. Dam Breaks
3. Pit Flood
4. Severe Wind Storm
5. Winter Storm
6. Lightning Strike

III. Slow-Building River Flood & Pit Floods

Situation:

Spring thaws have brought the river to near flood levels. Additionally, ice flows are beginning to choke narrow bends in the river and create ice and debris dams at bridge abutments. The ground remains frozen so storm water runoff is at its peak. The National Weather Service (NWS) forecasts up to seven days of spring rains.

The first day of incessant rain guarantees some flooding in low-lying agricultural and recreation lands. The NWS issues flood forecast and the chief executive officer and/or mine manager calls for a flood watch. All emergency services personnel go on standby alert and the EOC maintains a 2-hour communications watch.

The rain has puddle flood spots in the mining pit areas and continues to overflow the flood channels. Highwalls and haulage roads begin to erode away and flood all routes and entrances.

By the end of the second day of rains, upstream communities are experiencing severe flooding and the river have not yet crested. Severe flooding is expected to affect this community during the night of the second day. Mutual aid agreements are reaffirmed with neighboring communities which are out of the floodplain.

By the third day, the public is advised of imminent severe flooding. Probable flood zones are broadcast by radio and television. Citizens in these areas are advised about procedures for preparing for flood. The EOC activates a highway

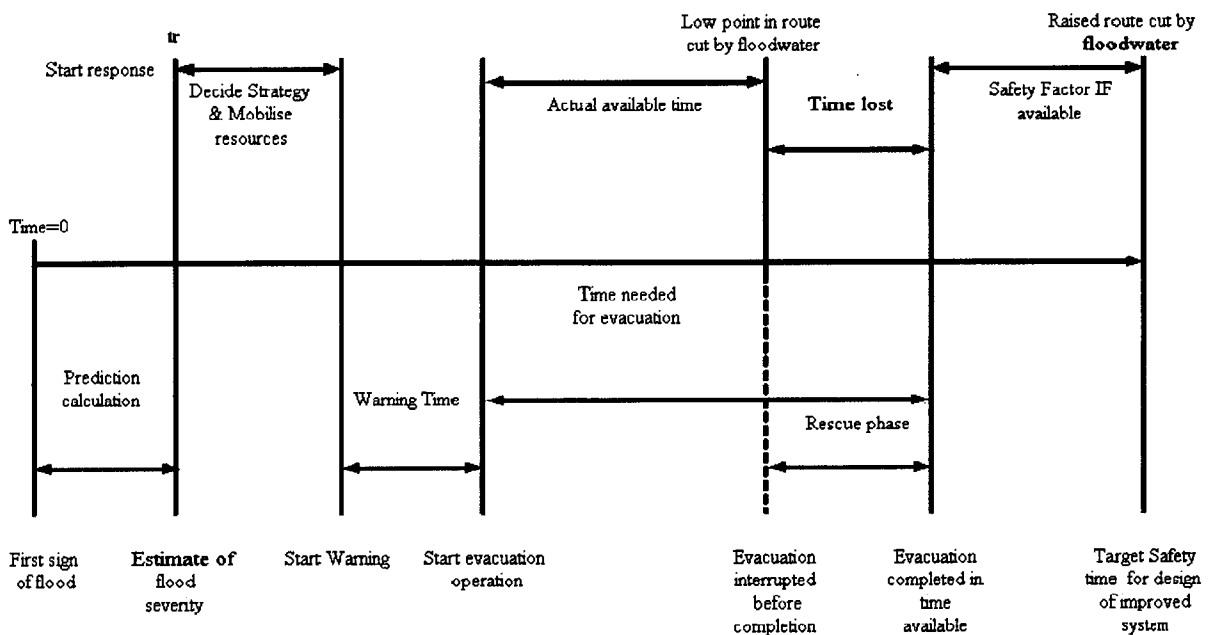
traffic control plan to expedite evacuation of flood areas.

An upstream community reports that a major levee has broken through and some old bridges were washed away. This has caused rapid increases in flooding downstream.

By the fourth day, emergency personnel who are helping evacuate citizens report that floodwater has already encroached on a major evacuation route. The flood and rains continue and citizens and employees were informed by EOC officials that anticipate floodwaters so high that one hospital and one temporary shelter must now be evacuated. Some of the hospital patients must be transported to a facility in a neighboring community. Municipal power supplies must be turned off in 33 percent of the community. Community water supply is contaminated and residents well out of the floodplain are required to use emergency water supplies.

Timeline of Emergency Response for Flood Evacuation

Schematic Time Line of Emergency Response for Flood Evacuation



Response & Evacuation

All Sand & Gravel Personnel will follow the San Juan Sand and Gravel Emergency Action Evacuation Plan. The mine emergencies will follow the following outline:

NOTIFICATION

Activate Notification Procedures for Emergency Contacts.
Notify MSHA Officials.

Notify State & Tribal Officials.
Notify Key Mine Officials.
Notify Miners' Representatives.
Notify Police.
Notify Fire/Rescue Organizations.
Notify Neighboring Mines.
Notify Family Members.
Notify Medical Support Personnel.

SHUTDOWN OPERATION

Assemble Employees.
Debrief Witnesses.
Account for All Persons Known to Be at the Mine.
Assign Employees to Tasks.

SECURITY AND SITE MONITORING

Establish Security - All Access Roads.
Establish Check-in/Check-out System for All Authorized Persons.
Assign Site Monitors and Shift Rotation Schedule.
Establish Parking Area and Staging Area.

COMMAND CENTER

Follow Mine Emergency Response Plan.
Set up a Mine Emergency Command System.
Staff Emergency Organization.
Delegate Authority and Assign Duties.
Give Appropriate Orders.
Brief Arriving Personnel.
Review ALL Mine Maps and Coordinate Reference Points on ALL Maps.
Make Extra Copies of Maps
Establish Gas Monitoring, Data Analysis, and Trend Analysis.
Follow Appropriate Safety Precautions.
Request/Dispatch Additional Persons to Mine as Required.
Take Appropriate Actions Relative to Site Recovery.
Establish a Shift Rotation Schedule for Command Personnel.

COMMUNICATIONS

Relay Information to the Command Center.
Establish External Communications (Corporate, MSHA, State, Miner's Representatives, Medical, Legal, Etc.).
Monitor and Log All Communications.

MEDICAL ARRANGEMENTS

Arrange for Ambulance and Medical Services.
Set up Temporary Morgue (if required).

ACQUISITION OF EQUIPMENT, MATERIALS, AND SERVICES

List All Equipment in the Mine and on the Surface.
Locate and Check On-site Equipment for Possible Use.
Arrange for Heavy Equipment if Required.

Arrange for Portable Radios.
 Provide Transportation for Equipment.
 Obtain Personal Protective Equipment.
 Establish Waiting and Briefing Area for Family/Relatives (Provide Food and
 Sitting/Sleeping Area).
 Establish Press Briefing Area.

INFORMATION

Appoint a Spokesperson for All Entities.
 Brief Family Members on a Regular Schedule.
 Brief the Press and Media on a Regular Schedule.

Emergency Contacts:

Mine Emergency Contacts.

1. Steve Gundersen	President	(505) 259-0260
2. TBD	Vice-President	(505) 331-9487
3. TBD	Treasurer/Secretary	(505) 331-9487

MSHA Officials.

1. Neal Merrifield	Administrator	(202) 693-9600
2. Micheal Hancher	Deputy Administrator	(202) 693-9600
3. Micheal Franklin	Accident Investigation	(202) 693-9760
4. Lawrence Trainor	Safety Division	(202) 693-9640
5. Christopher Findlay	Health Division	(202) 693-9640

State & Tribal Officials.

1. Ben Gilmore	Mine Inspector/Trainer	(928) 871-7097
2. Ram S. Das	Senior Mining Engineer	(928) 871-7934
3. Larry Benny	Albuquerque MSHA Office	(505) 346-6775
4. Richard Laufenberg	Denver District Office	(303) 231-5465

Police.

1. Shiprock Police Department	(505) 368-1351
2. San Juan County Sheriff's Office	(505) 598-0475

Fire/Rescue Organizations.

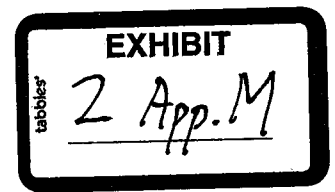
1. Shiprock Fire Department	(505) 368-5719
2. Kirtland Fire Department	(505) 598-0475

Emergency Medical Services.

1. Shiprock EMS	(505) 368-6175
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Neighboring Mines.

1. Four Corners Materials	(505) 324-3905
2. Sky Ute Sand & Gravel	(505) 566-9900



Appendix M 401 Certification Permit Application

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"



Navajo Nation Environmental Protection Agency (NNEPA)
Water Quality Program (WQP)
401 Water Quality Certification Application
Dredged and/or fill Material Affecting Waters of the Navajo Nation



401 Project ID #: _____ (For NNEPA Use Only)

APPLICANT INFORMATION

Applicant Name: Samuel Woods Title: President
Applicant's Company, Agency, etc.: Dibe Niista Sand & Gravel, LLC.
Physical Address: 15 miles East of Hwy 401 on Highway N36 and 2 miles North on Navajo Route N366
Applicant's Mailing Address: PO Box 3303, Shiprock, NM 87420
Email: dibentista@dibentista.com and woods@dibentista.com Fax #: (877) 203-0852
Phone #: (877) 203-0852 Cell#: (505) 250-0260

SUBCONTRACTOR INFORMATION

Name of any Subcontractor involved in project: N/A
Address: _____ Phone #: _____
Contact Person of Subcontractor: _____ Title: _____

PROJECT INFORMATION

Name of Project & Project Description: Dibe Niista Sand & Gravel, LLC.
The project will produce and sell various types and grades of gravel to the public and private customers in the Northern, New Mexico Region; concentrating in the area of Shiprock, New Mexico.
Activity of Project Dates (beginning to end): July 2010 to July 2015
Location of Project (include GPS coordinates, UTM, latitude, longitude topographic map name with identifying map (1-24,000 scale)): _____
The latitude and longitude (at center of project) is 36 deg 44' 29.87" N and 108 deg 34' 16.53" W.
Please see attachment "A" for legal survey and attachment "B" for topographic map.
Directions to project location (nearest highways and landmarks). Please include map(s) or drawings displaying location. 15 miles East of Hwy 401 on Highway N36 and 2 miles North on Navajo Route N366. Please see attachment "C" for project location.
Navajo Chapter(s) affected: San Juan Chapter
Name of affected waterbody(ies): San Juan River. The San Juan river sits 50-60 feet above the Project site. It is expected to have a 60 m buffer from the river boundaries.
Estimated Quantities of Material to be Dredge or used as fill (cubic yards): no dredging techniques will be used.
The project sits 50 to 60 feet above the San Juan River. Material to be mined is "alluvial" minerals.
Source and description of fill material (acre): The project will mine "alluvial" minerals and filled with overburden/topsoil per our Mining and Reclamation Plan.
Total Estimated Acreage of waterbody/wetland impacted by entire project: _____
105 acres for Dibe Niista Sand & Gravel Project. No impact to wetland areas or waterbodies.
Description of Conditions prior to construction (please include aerial, land-base photos): _____
the project site is relatively flat with a vast deposits of "alluvial" minerals. The project site generally runs east to west and there are no runoffs and no riparian wetland vegetation within the project site boundary. Great Basin Desert Scrub Plant Community vegetation exist within the project site. Please see attachment "D" for aerial and land-base photos.

Description of proposed Best Management Practices (BMPs)/Protective Measures to ensure protection of water quality (WQ parameters of concern), before, during, and after construction of Project (attach additional sheet if necessary): The best management practices and protective measures are detailed in our Mining and Excavation Plan. All parameters to ensure protection of water quality will be used before, during, and after construction activities.

ADDITIONAL INFORMATION

Respectively contacted US Army Corps of Engineers (USCOE) or other permitting agency(ies): X Yes ___ No
If yes, name of agency, project manager and type of permit issued: U.S. Corps of Engineers, Deanna Cummings.
No permit is issued, but advise we will not need a wetland delineation study.

(Please provide NNEPA WQP a copy of all information submitted to the permitting agency)

If no, USCOE will need to be notified before project begins. Notification will be given to NNEPA by the applicant ensuring USCOE is aware of Project.

What local, tribal, state, and/or federal agencies/departments were notified (list) along with person contacted: Navajo Nation Mineral Department (Ram Das), NNEPA (Rita Larsen), US Corps of Engineers (Deanna Cummings), BIA Real Estate (Mary Lujan), Office of President & Vice-President (Patrick Sandoval), Resources Committee (All). Etc.

SIGNATURE OF APPLICANT

I have reviewed the following items: Navajo Nation Surface Water Quality Standards (NNSWQS), and NNSWQS Certification Regulations. (www.navajoepa.org)

By signing this application, you certify that all information is true to the best of your knowledge and notification will be given to NNEPA/Water Quality Program if any changes or modification occur before, during, or after the proposed project. By signing this application you also consent to the jurisdiction of the Navajo Nation and the courts of the Navajo Nation regarding any matters in any way relating to this application. By signing this application you read and understand the NNSWQS.



Signature of Applicant

Date

RETURN ADDRESS

Please feel free to attach additional information that will assist in the review process. Upon Completion, mail to: NNEPA-Water Quality Program, P.O. Box 339, Window Rock, AZ 86515

Tel: (928) 871-7690

Faxed or emailed applications are acceptable, but issuance of the 401 Certification is contingent on applicant's submittal of hard copy application with original signature.



A Mandatory 30-day Public Notice Period [§ 306 of NNSWQS Certification Regulations] is required after review and application is complete.

Any materials (construction, equipment, etc.) used for the project should not be stored within any waterbodies.

Revised: 08/09

Proposed sand and gravel mining operation near Shiprock Inbox | X

from **Cummings, Deanna L SPA**

[hide details](#) **May 28**  **Reply** 

<Deanna.L.Cummings@usace.army.mil>

to ● swnmsuee@gmail.com

cc "Wrbas, Christopher R SPA"

<Christopher.R.Wrbas@usace.army.mil>,
Steve Austin <nnepawq@frontiernet.net>

date **Fri, May 28, 2010 at 3:24 PM**

subject **Proposed sand and gravel mining operation near
Shiprock**

mailed-by **usace.army.mil**

Sam:

Thanks for your call today regarding the proposed sand and gravel mining on the property southeast of Shiprock, on the south bank of the San Juan River just east of the confluence with the Chaco River. You will need to write a letter to Chris Wrbas in our Durango office (address below) for a no permit required determination. I was asked at the time to determine the jurisdictionality of one of the waters on the property, but was not provided with a map showing the limits of the proposed activity. In your correspondence, you should provide a detailed description of your proposed activity, a map showing the limits of work and any jurisdictional waters, and any cultural sites/resources occurring on the property.

I will make sure that Chris has all the information regarding the previous jurisdictional determination. His address:

U.S. Army Corps of Engineers
Durango Regulatory Office
799 East 3rd Street, Unit 2
Durango, CO 81301

Let me know if you have any additional questions.

Deanna

Deanna L. Cummings
US Army Corps of Engineers
Regulatory Division
4101 Jefferson Plaza NE
Albuquerque, NM 87109
505-342-3280 phone
505-342-3498 fax

Dibe Niista, LLC.

PO Box 3393
Shiprock, NM 87420
Phone: 505-259-0260

■ ENGINEERS ■ ENERGY ■ DEVELOPMENT ■ CONSTRUCTION

June 4, 2010

U.S. Army Corps of Engineers
Durango Regulatory Office
799 East 3rd Street, Unit 2
Durango, CO 81301

Attention: Christopher R. Wrbas, SPA

Ref: Dibe Niista Sand & Gravel Mining Project– No Permit Required
Determination

Dear Mr. Wrbas:

The mining lease issued by the Department of Interior/Bureau of Indian Affairs and Navajo Nation has a term limit of five (5) years to mine for sand and gravel in the San Juan Chapter Community of San Juan County, Navajo Nation. Our project site encompasses 105 acres total, of which 95 acres is proposed to be mined for aggregate. In our first (1st) 5-year lease, only 20~25 acres will be mined with an estimated yield of 800,000 short tons of materials during this lease period. The mining duration of the overall project mining activities will occur for the next 20 to 25 years.

Several months ago, we requested the U.S. Corps of Engineers – Durango Regulatory Office, Ms. Deanna Cumming to determine jurisdictional of the waters near and around the project site. She provided a verbal determination of “No Permit Required”, but to include a buffer zone from the San Juan River and any navigate able waterways that flow back into the San Juan River or Chaco River. If you look at our detail mining maps, we’ve included these buffer zones around the project site boundaries.

The Dibe Niista Sand & Gravel Mining & Reclamation Plan has been under review with the Navajo Nation Minerals Department for the last five (5) months under Ram S. Das, Senior Mining Engineer. In his reviews, we’ve made numerous revisions to address any mining & reclamation activities to; haulage roads, slope/highwall design, mining & reclamation activities, training, biological and cultural environments, water & wastewater resources, and air qualities.

In this plan, all activities conducted by Dibe Niista Sand & Gravel within the Navajo Nation shall abide by all laws and regulations of the Navajo Nation and the United States that include but not limited to the following:

Title 25, Code of Federal Regulations, Parts 211 and 216;

Title 30, Code of Federal Regulations, Part 46 and 56;

The Navajo Nation Mine Safety Code 18 N.N.C. § 401;

The Navajo Nation Preference in Employment Act, 15 N.N.C. § 601 et seq.;

The Navajo Nation Business Opportunity Act, 5 N.N.C. § 201 et seq.

The Navajo Nation Water Code, 22 N.N.C. § 1101 et seq.

Attached to this letter are documents that outline the project site with boundaries, mining activities, and environmental assessments.

The proposed plan is a working document and a practical approach to mining and reclamation of the project site. The recommended methods and criteria form the basis of construction and operational procedures for mining & reclamation is followed in the phased mining plans of the site until its mining closure.

If you have any questions concerning our Mining and Reclamation Plan, please contact me at (505) 259-0260. Thank you.

SG/as

C: Aktar Zaman, Director, Navajo Nation Minerals Department
Ram S. Das, Senior Mining Engineer, Navajo Nation Mineral Department
Mary Lujan, Reality Officer, Bureau of Indian Affairs
Deanna L. Cummings, U.S. Army Corps of Engineers
Steve Austin, Navajo Nation EPA – Water Quality



NAVAJO NATION ENVIRONMENTAL PROTECTION AGENCY
Water Quality NNPDES Program
P.O. Box 1999
Shiprock, New Mexico 87420
Phone: (505) 368-1037
FAX: (505) 368-1416

Dr. Joe Shirley, Jr.
PRESIDENT

Ben Shell
VICE PRESIDENT

June 23, 2010

President
Dibe Niista, LLC.
P.O. Box 3393
Shiprock, NM 87420

RE: Clean Water Act Section 401 Certification for Proposed Dibe Niista Sand and Gravel Mining Project (Project ID No. 2010-0016SR)

Thank you for submitting a Clean Water Act (CWA) section 401 water quality certification application for your proposed sand and gravel operation near the Hogback. Chris Wrbas of the U.S. Army Corps of Engineers has determined that your project will not need a CWA section 404 permit because no discharge of fill material into a jurisdictional water of the United States will occur. As a result, you will not need a 401 certification from our program either.

Though you will not need the certification, a review of the documents you submitted with your application raised several concerns that should be addressed in the environmental assessment:

- 1) There are at least 10 plugged and abandoned (P&A) oil wells located within and/or immediately adjacent to your proposed operation. Several unlined pits that were associated with this oil operation have also been remediated in the area. Your operation will need to properly protect the P&A wells during excavation activities. You will also need to ensure that any oil contaminated materials uncovered during excavation are disposed of properly. These materials may include buried abandoned pipelines, oil contaminated sands and gravels, etc.
- 2) Your plans indicated that the facilities will be located near the bluff at the northwest end of your proposed lease. Any fuel storage needs to comply with the federal Spill Prevention Control, and Countermeasure regulations issued under the Oil Pollution Act. The proximity to the San Juan River will likely trigger your need to comply with these regulations even if your total storage capacity is below 1320 gallons. Also, you will need to ensure that your septic waste does not contaminate the San Juan or the shallow groundwater known to occur on that terrace.

3) You will need to prepare a notice of intent and a storm water pollution prevention plan in order to be covered by a general storm water permit under section 402 of the CWA. If there will be any washing of gravels or other material that will result in the discharge of water into the San Juan or any nearby drainages on the terrace, then an individual National Pollutant Discharge Elimination System permit under CWA section 402 will also be necessary.

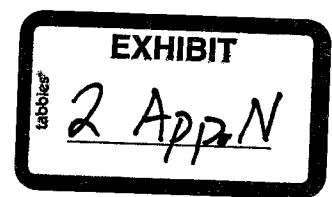
4) If you are washing gravels on site, the additional water added to the terrace may leach out naturally occurring contaminants that are a concern for the San Juan River endangered fish recovery program. If these additional contaminants reach the San Juan through groundwater or increased seepage along the bluff, then U.S. Fish and Wildlife will need to be consulted to ensure that no negative impacts to these fish will occur.

If you have any questions regarding any of the concerns listed above, please do not hesitate to contact me at 505-368-1037. Thank you for your compliance with the CWA.

Sincerely,

Stephen A. Austin
Senior Hydrologist
Navajo EPA Water Quality Program

cc: Chris Wrbas, USACE
Ram Das, NN Minerals
File



**Appendix N Mine Safety and Health Administration
(MSHA) Training Plan**

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"

The San Juan Sand and Gravel Mine Safety and Health Administration (MSHA) Training Plan is under internal review and once finalized it will be submitted to the following agencies for approval:

Final Submittal for Part 46 Approval

Mine Safety Health Administration/EFS
Denver District Office
P.O. Box 25367, DFC
Denver, CO 80225-0367

Attention: Eric Johnson

Submittal for Review

Mine Safety Health Administration/EFS
Albuquerque Field Offices
2 Park Central Tower
300 San Mateo Blvd N.E., Suite 407
Albuquerque, NM 87108

Attention: Elsa A. Montoya

All activities conducted by San Juan Sand and Gravel within the Navajo Nation shall abide by all laws and regulations of the Navajo Nation and the United States that include but not limited to the following:

Title 25, Code of Federal Regulations, Parts 211 and 216;

Title 30, Code of Federal Regulations, Part 46 and 56;

The Navajo Nation Mine Safety Code 18 N.N.C. § 401;

The Navajo Nation Preference in Employment Act, 15 N.N.C. § 601 et seq.;

The Navajo Nation Business Opportunity Act, 5 N.N.C. § 201 et seq.

The Navajo Nation Water Code, 22 N.N.C. § 1101 et seq.



**Appendix O NPDES Checklist and Navajo Nation
Laws and Regulations**

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"



NPDES General Construction Storm Water Permit Checklist

(including storm water discharges from dedicated asphalt and concrete plants)



Site Description

- ☐ Nature of the activity
- ☐ Intended sequence of major events
- ☐ Timing
- ☐ Which permittee is responsible
- ☐ Total area of site, area to be disturbed (including off-site borrow and fill areas)
- ☐ Run-off coefficient for pre-construction and post-construction
- ☐ General location map
- ☐ Discharge locations
- ☐ Receiving water
- ☐ Wetland or special aquatic sites (on-site, near or receiving discharges)
- ☐ Copy of the permit language
- ☐ Endangered species information (threatened or endangered species, or critical habitat are found in proximity)
- ☐ Historic Preservation Information (including any written agreements with SHPO, THPO)

Structural Practices

- ☐ Structures used to divert storm water
- ☐ Structures used to store storm water
- ☐ Post-construction controls (required when sediment or other pollutants leaving the site will exceed pre-development levels)
- ☐ Technical explanation why practices are selected
- ☐ Velocity dissipation devices
- ☐ Controls used to prevent solid materials
- ☐ Controls used to minimized offsite tracking
- ☐ Compliance with local and state regulations
- ☐ Materials to be stored on-site (with updates)
- ☐ Pollutants from support activities (asphalt/concrete plant)
- ☐ Control measures for support activities
- ☐ Measures to protect threatened or endangered species, or critical habitat

Site Map

- ☐ Drainage patterns
- ☐ Approximate slopes after major grading
- ☐ Areas of soil disturbance
- ☐ Areas which will not be disturbed
- ☐ Locations of control measures
- ☐ Locations where stabilization practice are expect to occur
- ☐ Location of off-site storage of material, waste, borrow, or equipment storage
- ☐ Surface waters
- ☐ Storm water discharge locations

Stabilization Practices

- ☐ Description of interim stabilization practices
- ☐ Description of permanent stabilization practices
- ☐ Schedule of implementation
- ☐ Dates when major grading activities occur
- ☐ Dates when construction activities cease (permanently or temporarily)
- ☐ Type of stabilization used and location

Other

- ☐ Maintenance Procedures
- ☐ Inspections (of disturbed areas, areas used for material storage, control measures, and vehicle access)

Inspection Reports

- ☐ Name & qualification of inspector
- ☐ Date
- ☐ Major observations
- ☐ If everything is okay, certification that facility is in compliance with SWPPP.
- ☐ Non-storm water discharge sources
- ☐ Control measure used on non-storm water discharges
- ☐ Plan Certification

8/26/98

Erosion & Sediment Controls

- S Control measures used should be designed to keep sediment on site
- S Control measures should be properly selected, installed and maintained in accordance with manufactures specification and good engineering practices
- S Accumulated sediment, off-site, must be removed often enough to minimize impacts
- S Sedimentation ponds/traps must be cleaned out when 50% full (by volume)
- S Litter must be prevented from being a pollutant
- S Offsite material storage areas are consider part of the plan

Some Stabilization Practices

Preservation of
Existing Vegetation
Protection of Trees
Vegetative Buffer Strips
Mulching
Geotextiles
Temporary Vegetation
Permanent Vegetation
Sod Stabilization

Avoid: Impervious surfaces for stabilization

Inspections

- P Performed every fourteen days or after ½ inch rain
- P Major observations to be made during inspections:
 - locations of discharges of sediment or other pollutants from the site
 - locations BMPs that are need of maintenance
 - locations BMPs that are not performing, failing to operate, or were inadequate
 - locations were additional BMPs are needed

Some Structural Practices

Silt Fences	Pipe Slope Drains
Earth Dikes	Level Spreaders
Drainage Swales	Inlet Protection
Sediment Traps	Outlet Protection
Check Dams	Gabions
Subsurface Drains	Sediment Basins

SPILLS and RELEASES (of reportable quantities) - The following steps must be taken:

- 1) Notify the National Response Center 800/424-8802 as soon as you have knowledge of the spill;
- 2) The SWPPP must be modified within 14 days to provide a description of the release, the circumstances leading to the release and the date of the release;

In semi-arid and arid areas, during seasonal arid periods inspection are only required once a month.

This is also true for sites that won't have runoff because of winter conditions. (frozen!)

Sites that are finally stabilized, too.

Sedimentation Basins

For any discharge location that serves an area of ten or more acres a sedimentation basin or equivalent controls must be used.

This sediment basin must be sized to provide storage for runoff from a 2 year, 24 hour storm or 3600 cubic feet.

Runoff from acreage that has been diverted around both the disturbed area and the sedimentation basin does not count

"Final Stabilization" means a uniform perennial vegetative cover of at least 70% of the native background cover for the area

The NPDES permit number must be posted at the site (or NOI if permit # has not be assigned)

To order NOI forms or permit language: 202/260-7786
Region 6 Storm Water Help line: 800/245-6510
Storm Water Home Page: www.epa.gov/region6/sw/



This Section of the Storage Nation EPA Laws & Regulations are not meant for official copies.

If you would like an official copy of any of the following Laws & Regulations please contact the right EPA office.

Layers

[illegible]

References

National Issues: Solid Waste Regulations
National Issues: Industrial Discharge Control/Clean Water Act
National Issues: Clean Air Act Standards
National Issues: Air Quality Criteria Program; Operating Permit Requirements
National Issues: Primary Drinking Water Regulations
National Issues: Underground Injection Control Requirements
NW Citizens' Guide: Federal Register, Administrative Enforcement Orders, Hearings & Judicial Review
(NW Environmental Action)

Information here has not been updated, therefore if you have any questions or comments please call the operator NNEPA office.
Call 1-800-455-6013 for NNEPA Office.



**Appendix P San Juan Sand and Gravel Project Test
Reports**

SAN JUAN SAND & GRAVEL PROJECT

Formally Known As "Dibe Niista Sand & Gravel"

Sample Batch Test Group No. 1 (5 Buckets)

Test Conducted by: Fort McDowell Yavapai Materials

Date Tested: August 31, 2007

Date Reviewed: September 4, 2007

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0092507				Fine Sieve Factor = 0.0378185		Sieve Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		5413	50	50		(A) Liquid Limit	
1" / 25mm		1871	17	33		(B) Plastic Limit	
3/4" / 19mm		406	4	29		P.I. = (A - B)	
1/2" / 12.5mm		465	4	25		SPECIFIC GRAVITY	
3/8" / 9.5mm		290	3	22		Weight in Water (a)	%
1/4" / 6.3mm		217	2	20		SSD Weight (b)	
# 4 / 4.75mm		108	1	19		Oven Dry Weight ©	
Retained # 4 / 4.75mm		8770	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		499	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		2040	Wt. After Wash		367	MOISTURE SAMPLE	
Total Sample Weight		10810	Elutriation			(a) Wet Weight	0
# 8 / 2.36mm		6	0	19		(b) Dry Weight	0
#10 / 2mm		33	1	17		% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm		25	1	16		COMMENTS	
#30 / 600um		58	2	14			
#40 / 425um		65	2	12			
#50 / 300um		79	3	9			
#100 / 150um		52	2	7		SAMPLE # 1	
#200 / 75um		46	1.7				
PASS		3		5.1			
# 200 / 75um							
Total - # 4 Split		367					
TESTED BY:		LS		DATE TESTED:		31-Aug-07	
REVIEWED BY:		BL		DATE REVIEWED:		4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.200400802		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a) %	
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		499	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		367	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		6	1	99	1	(b) Dry Weight 0	
#10 / 2mm		33	7	92		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		25	5	87	13	COMMENTS	
#30 / 600um		58	12	76	24		
#40 / 425um		65	13	63			
#50 / 300um		79	16	47	53	SAMPLE # 1	
#100 / 150um		52	10	36	64		
#200 / 75um		46	9.2				
PASS		3		27.1			
# 200 / 75um					1.56	SE =	
Total - # 4 Split		367					
TESTED BY:		LS			DATE TESTED:		31-Aug-07
REVIEWED BY;		BL			DATE REVIEWED:		4-Sep-07

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.295857988		Hydrometer	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	% Organic		
English / Metric					Silt/Clay		
3" / 75mm					Other		
2 1/2" / 53mm					HYDROMETER		
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm					SILT & CLAYS		
3/8" / 9.5mm					MAT'L	Weight	%
1/4" / 6.3mm					SILT		
# 4 / 4.75mm					CLAY		
Retained # 4 / 4.75mm		Wt. Before Wash (W)			SAND		
PASS WET		Wt. Before Wash (D)		338	MOISTURE SAMPLE		
# 4 / 4.75 DRY		Wt. After Wash		239	(A) Wet Weight		
Total Sample wt.		Elutriation			(B) Dry Weight		
# 10 / 2mm	32	9.5		< 3%	% Moisture (A-B/A*100)		
# 18 / 1.00mm	15	4.4		< 10%	% ORGANIC		
# 35 / 500um	35	10			1	2	AVG
# 60 / 250um	39	12		#35 + # 60 > 60%	(a) Wt. Before		
# 100 / 150um	53	15.7		< 20%	(b) Wt. After		
# 140 / 106um	32	9.5			% Org (A - B / A x 100)		
# 270 / 53 UM	31	9.2		#140 + # 270 < 5%	COMMENTS		
PASS	2	0.6		< 3 %			
# 270 / 53um							
Total - # 4 Split	239				SAMPLE # 1		
TESTED BY:	BL	DATE TESTED:		4-Sep-07			
REVIEWED BY:	BL	DATE REVIEWED:		4-Sep-07			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0061214				Fine Sieve Factor = 0.0606762		Sive Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		8253	51	49		(A) Liquid Limit	
1" / 25mm		1742	11	39		(B) Plastic Limit	
3/4" / 19mm		698	4	35		P.I. = (A - B)	
1/2" / 12.5mm		678	4	30		SPECIFIC GRAVITY	
3/8" / 9.5mm		439	3	28		Weight in Water (a) %	
1/4" / 6.3mm		403	2	25		SSD Weight (b)	
# 4 / 4.75mm		178	1	24		Oven Dry Weight ©	
Retained # 4 / 4.75mm		12391	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		398	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		3945	Wt. After Wash		302	MOISTURE SAMPLE	
Total Sample Weight		16336	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		26	2	23		(b) Dry Weight 0	
#10 / 2mm		5	0	22		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		12	1	22		COMMENTS	
#30 / 600um		53	3	18			
#40 / 425um		45	3	16			
#50 / 300um		33	2	14			
#100 / 150um		61	4	10		SAMPLE # 2	
#200 / 75um		63	3.8				
PASS		4		6.1			
# 200 / 75um							
Total - # 4 Split		302					
TESTED BY:				LS		DATE TESTED:	
						31-Aug-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.251256281		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm			100		F.M.	Weight in Water (a) %	
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm	0	0	100		0	Oven Dry Weight ©	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				Sp. Gravity = c / (b-a)	
PASS WET		Wt. Before Wash (D)			398	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		Wt. After Wash			302	MOISTURE SAMPLE	
Total Sample Weight		Elutriation				(a) Wet Weight 0	
# 8 / 2.36mm	26	7	93		7	(b) Dry Weight 0	
#10 / 2mm	5	1	92			% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm	12	3	89		11	COMMENTS	
#30 / 600um	53	13	76		24		
#40 / 425um	45	11	65				
#50 / 300um	33	8	56		44	SAMPLE # 2	
#100 / 150um	61	15	41		59		
#200 / 75um	63	15.8					
PASS	4		25.1				
# 200 / 75um					1.44	SE =	
Total - # 4 Split	302						
TESTED BY:				LS		DATE TESTED:	
						31-Aug-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117					TESTS REQUIRED		
Course Sieve Factor =			Fine Sieve Factor =		Sieve Analysis		
			0.251256281		Hydrometer		
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	% Organic		
English / Metric					Silt/Clay		
3" / 75mm					Other		
2 1/2" / 53mm					HYDROMETER		
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm					SILT & CLAYS		
3/8" / 9.5mm					MAT'L	Weight	%
1/4" / 6.3mm					SILT		
# 4 / 4.75mm					CLAY		
Retained # 4 / 4.75mm		Wt. Before Wash (W)			SAND		
PASS WET		Wt. Before Wash (D)		398	MOISTURE SAMPLE		
# 4 / 4.75 DRY		Wt. After Wash		303	(A) Wet Weight		
Total Sample wt.		Elutriation			(B) Dry Weight		
# 10 / 2mm	31	7.8		< 3%	% Moisture (A-B/A*100)		
# 18 / 1.00mm	17	4.3		< 10%	% ORGANIC		
# 35 / 500um	64	16			1	2	AVG
# 60 / 250um	68	17		#35 + # 60 > 60%	(a) Wt. Before		
# 100 / 150um	53	13.3		< 20%	(b) Wt. After		
# 140 / 106um	32	8.0			% Org (A - B / A x 100)		
# 270 / 53 UM	37	9.3		#140 + # 270 < 5%	COMMENTS		
PASS	1	0.3		< 3 %			
# 270 / 53um							
Total - # 4 Split	303				SAMPLE # 2		
TESTED BY:	LS	DATE TESTED:		31-Aug-07			
REVIEWED BY:	BL	DATE REVIEWED:		4-Sep-07			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0029428				Fine Sieve Factor = 0.0360091		Sive Analysis	
						Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor		
English / Metric					Specific Gravity		
3" / 75mm					Unit Weight		
2 1/2" / 53mm					PLASTICITY INDEX		
2" / 50mm			100			1	2
					AVG		
1 1/4" / 31.5mm	18757	55	45		(A) Liquid Limit		
1" / 25mm	4888	14	30		(B) Plastic Limit		
3/4" / 19mm	2200	6	24		P.I. = (A - B)		
1/2" / 12.5mm	2019	6	18		SPECIFIC GRAVITY		
3/8" / 9.5mm	780	2	16		Weight in Water (a)		%
1/4" / 6.3mm	623	2	14		SSD Weight (b)		
# 4 / 4.75mm	260	1	13		Oven Dry Weight ©		
Retained # 4 / 4.75mm	29527	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)		
PASS WET		Wt. Before Wash (D)		364	% Absorption = (b-c) / c		
# 4 / 4.75 DRY	4454	Wt. After Wash		208	MOISTURE SAMPLE		
Total Sample Weight	33981	Elutriation			(a) Wet Weight		0
# 8 / 2.36mm	23	1	12		(b) Dry Weight		0
#10 / 2mm	5	0	12		% Moisture (a-b / a * 100)		#DIV/0!
#16 / 1.18mm	13	0	12		COMMENTS		
#30 / 600um	26	1	11				
#40 / 425um	20	1	10				
#50 / 300um	14	1	9				
#100 / 150um	50	2	8		SAMPLE # 3		
#200 / 75um	49	1.8					
PASS	8		5.9				
# 200 / 75um							
Total - # 4 Split	208						
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sive Analysis	
				0.274725275		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm			100		F.M.	Weight in Water (a)	%
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm	0	0	100		0	Oven Dry Weight ©	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				Sp. Gravity = c / (b-a)	
PASS WET		Wt. Before Wash (D)			364	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		Wt. After Wash			208	MOISTURE SAMPLE	
Total Sample Weight		Elutriation				(a) Wet Weight	0
# 8 / 2.36mm	23	6	94		6	(b) Dry Weight	0
#10 / 2mm	5	1	92			% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm	13	4	89		11	COMMENTS	
#30 / 600um	26	7	82		18		
#40 / 425um	20	5	76				
#50 / 300um	14	4	72		28	SAMPLE # 3	
#100 / 150um	50	14	59		41		
#200 / 75um	49	13.5					
PASS	8		45.1				
# 200 / 75um					1.05	SE =	
Total - # 4 Split	208						
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.274725275		Hydrometer	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	% Organic		
English / Metric					Silt/Clay		
3" / 75mm					Other		
2 1/2" / 53mm					HYDROMETER		
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm					SILT & CLAYS		
1/4" / 6.3mm					MAT'L	Weight	%
# 4 / 4.75mm					SILT		
Retained # 4 / 4.75mm		Wt. Before Wash (W)			CLAY		
PASS WET		Wt. Before Wash (D)		364	SAND		
# 4 / 4.75 DRY		Wt. After Wash		207	MOISTURE SAMPLE		
Total Sample wt.		Elutriation			(A) Wet Weight		
# 10 / 2mm	21	5.8		< 3%	(B) Dry Weight		
# 18 / 1.00mm	12	3.3		< 10%	% Moisture (A-B/A*100)		
# 35 / 500um	32	9			% ORGANIC		
# 60 / 250um	40	11		#35 + # 60 > 60%	1	2	AVG
# 100 / 150um	39	10.7		< 20%	(a) Wt. Before		
# 140 / 106um	20	5.5			(b) Wt. After		
# 270 / 53 UM	40	11.0		#140 + # 270 < 5%	% Org (A - B / A x 100)		
PASS	3	0.8		< 3 %	COMMENTS		
# 270 / 53um							
Total - # 4 Split	207				SAMPLE # 3		
TESTED BY:	BL	DATE TESTED:		4-Sep-07			
REVIEWED BY:	BL	DATE REVIEWED:		4-Sep-07			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0036642				Fine Sieve Factor = 0.0917406		Sieve Analysis	
						Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor		
English / Metric					Specific Gravity		
3" / 75mm					Unit Weight		
2 1/2" / 53mm					PLASTICITY INDEX		
2" / 50mm			100			1	2
1 1/4" / 31.5mm	9987	37	63		(A) Liquid Limit	22	AVG
1" / 25mm	2340	9	55		(B) Plastic Limit	19	
3/4" / 19mm	1766	6	48		P.I. = (A - B)	3	
1/2" / 12.5mm	1344	5	43		SPECIFIC GRAVITY		
3/8" / 9.5mm	1570	6	38		Weight in Water (a)		%
1/4" / 6.3mm	1267	5	33		SSD Weight (b)		
# 4 / 4.75mm	880	3	30		Oven Dry Weight ©		
Retained # 4 / 4.75mm	19154	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)		
PASS WET		Wt. Before Wash (D)		325	% Absorption = (b-c) / c		
# 4 / 4.75 DRY	8137	Wt. After Wash		178	MOISTURE SAMPLE		
Total Sample Weight	27291	Elutriation			(a) Wet Weight		0
# 8 / 2.36mm	8	1	29		(b) Dry Weight		0
#10 / 2mm	3	0	29		% Moisture (a-b / a * 100)		#DIV/0!
#16 / 1.18mm	10	1	28		COMMENTS		
#30 / 600um	28	3	25				
#40 / 425um	23	2	23				
#50 / 300um	17	2	22				
#100 / 150um	35	3	18		SAMPLE # 4		
#200 / 75um	43	3.9					
PASS	11		14.5				
# 200 / 75um							
Total - # 4 Split	178						
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.307692308		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	22
1" / 25mm						(B) Plastic Limit	19
3/4" / 19mm						P.I. = (A - B)	3
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a)	%
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		325	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		178	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight	0
# 8 / 2.36mm		8	2	98	2	(b) Dry Weight	0
#10 / 2mm		3	1	97		% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm		10	3	94	6	COMMENTS	
#30 / 600um		28	9	85	15		
#40 / 425um		23	7	78			
#50 / 300um		17	5	73	27	SAMPLE # 4	
#100 / 150um		35	11	62	38		
#200 / 75um		43	13.2				
PASS		11		48.6			
# 200 / 75um					0.90	SE =	
Total - # 4 Split		178					
TESTED BY:		BL			DATE TESTED:		4-Sep-07
REVIEWED BY;		BL			DATE REVIEWED:		4-Sep-07

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.307692308		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	
						CLAY	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			SAND	
PASS WET			Wt. Before Wash (D)		325	MOISTURE SAMPLE	
# 4 / 4.75 DRY			Wt. After Wash		179	(A) Wet Weight	
Total Sample wt.			Elutriation			(B) Dry Weight	
# 10 / 2mm		10	3.1		< 3%	% Moisture (A-B/A*100)	
# 18 / 1.00mm		11	3.4		< 10%	% ORGANIC	
# 35 / 500um		36	11			1	2
# 60 / 250um		34	10		#35 + # 60 > 60%	AVG	
# 100 / 150um		29	8.9		< 20%	(a) Wt. Before	
# 140 / 106um		21	6.5			(b) Wt. After	
# 270 / 53 UM		35	10.8		#140 + # 270 < 5%	% Org (A - B / A x 100)	
PASS		3	0.9		< 3 %	COMMENTS	
# 270 / 53um							
Total - # 4 Split		179				SAMPLE # 4	
TESTED BY:		BL	DATE TESTED:		31-Aug-07		
REVIEWED BY:		BL	DATE REVIEWED:		4-Sep-07		

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL: RAW MATERIAL		DATE SAMPLED: 31-Aug-07	
SAMPLE SOURCE: NEW MEXICO		SUBMITTED BY:	
GRADATION ASTM C-136 & ASTM C-117			TESTS REQUIRED
Course Sieve Factor = 0.0032927		Fine Sieve Factor = 0.0727543	
Sieve Size	Wt. Ret.	% Retained	% Passing
English / Metric			
3" / 75mm			
2 1/2" / 53mm			
2" / 50mm			100
1 1/4" / 31.5mm	12666	42	58
1" / 25mm	2010	7	52
3/4" / 19mm	2444	8	44
1/2" / 12.5mm	1642	5	38
3/8" / 9.5mm	1325	4	34
1/4" / 6.3mm	1186	4	30
# 4 / 4.75mm	767	3	27
Retained # 4 / 4.75mm	22040	Wt. Before Wash (W)	
PASS WET		Wt. Before Wash (D)	
# 4 / 4.75 DRY	8330	Wt. After Wash	
Total Sample Weight	30370	Elutriation	
# 8 / 2.36mm	22	2	26
#10 / 2mm	6	0	25
#16 / 1.18mm	15	1	24
#30 / 600um	24	2	23
#40 / 425um	22	2	21
#50 / 300um	15	1	20
#100 / 150um	51	4	16
#200 / 75um	56	4.1	
PASS	8		12.1
# 200 / 75um			
Total - # 4 Split	219		
TESTED BY: BL		DATE TESTED: 4-Sep-07	
REVIEWED BY: BL		DATE REVIEWED: 4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.265251989		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a)	%
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		377	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		219	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight	0
# 8 / 2.36mm		22	6	94	6	(b) Dry Weight	0
#10 / 2mm		6	2	93		% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm		15	4	89	11	COMMENTS	
#30 / 600um		24	6	82	18		
#40 / 425um		22	6	76			
#50 / 300um		15	4	72	28	SAMPLE # 5	
#100 / 150um		51	14	59	41		
#200 / 75um		56	14.9				
PASS		8		44.0			
# 200 / 75um					1.04	SE =	
Total - # 4 Split		219					
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.265251989		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	
Retained # 4 / 4.75mm						CLAY	
PASS WET						SAND	
# 4 / 4.75 DRY						MOISTURE SAMPLE	
Total Sample wt.						(A) Wet Weight	
# 10 / 2mm		18	4.8		< 3%	(B) Dry Weight	
# 18 / 1.00mm		9	2.4		< 10%	% ORGANIC	
# 35 / 500um		28	7			1	2
# 60 / 250um		37	10		#35 + # 60 > 60%	(a) Wt. Before	
# 100 / 150um		47	12.5		< 20%	(b) Wt. After	
# 140 / 106um		28	7.4			% Org (A - B / A x 100)	
# 270 / 53 UM		49	13.0		#140 + # 270 < 5%	COMMENTS	
PASS		4	1.1		< 3 %		
# 270 / 53um							
Total - # 4 Split		220				SAMPLE # 5	
TESTED BY:		BL	DATE TESTED:		4-Sep-07		
REVIEWED BY:		BL	DATE REVIEWED:		4-Sep-07		

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0039885				Fine Sieve Factor = 0.1222174		Sive Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			AVG
1 1/4" / 31.5mm		6244	25	75		(A) Liquid Limit	30
1" / 25mm		888	4	72		(B) Plastic Limit	22
3/4" / 19mm		1070	4	67		P.I. = (A - B)	8
1/2" / 12.5mm		1332	5	62		SPECIFIC GRAVITY	
3/8" / 9.5mm		1140	5	57		Weight in Water (a)	%
1/4" / 6.3mm		810	3	54		SSD Weight (b)	
# 4 / 4.75mm		565	2	52		Oven Dry Weight ©	
Retained # 4 / 4.75mm		12049	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		425	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		13023	Wt. After Wash		234	MOISTURE SAMPLE	
Total Sample Weight		25072	Elutriation			(a) Wet Weight	0
# 8 / 2.36mm		9	1	51		(b) Dry Weight	0
#10 / 2mm		2	0	51		% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm		5	1	50		COMMENTS	
#30 / 600um		24	3	47			
#40 / 425um		24	3	44			
#50 / 300um		20	2	42			
#100 / 150um		68	8	33		SAMPLE # 6	
#200 / 75um		64	7.8				
PASS		18		25.5			
# 200 / 75um							
Total - # 4 Split		234					
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.235294118		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric				FM		Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	30
1" / 25mm						(B) Plastic Limit	22
3/4" / 19mm						P.I. = (A - B)	8
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm			100	F.M.		Weight in Water (a)	%
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm	0	0	100	0		Oven Dry Weight ©	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				Sp. Gravity = c / (b-a)	
PASS WET		Wt. Before Wash (D)		425		% Absorption = (b-c) / c	
# 4 / 4.75 DRY		Wt. After Wash		234		MOISTURE SAMPLE	
Total Sample Weight		Elutriation				(a) Wet Weight	0
# 8 / 2.36mm	9	2	98	2		(b) Dry Weight	0
#10 / 2mm	2	0	97			% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm	5	1	96	4		COMMENTS	
#30 / 600um	24	6	91	9			
#40 / 425um	24	6	85				
#50 / 300um	20	5	80	20		SAMPLE # 6	
#100 / 150um	68	16	64	36			
#200 / 75um	64	15.1					
PASS	18		49.2				
# 200 / 75um				0.71		SE =	
Total - # 4 Split	234						
TESTED BY:		BL		DATE TESTED:		31-Aug-07	
REVIEWED BY;		BL		DATE REVIEWED:		4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.235294118		Hydrometer	
Sieve Size		Wt. Ret.		% Retained		% Passing	
English / Metric						Specs	
3" / 75mm							
2 1/2" / 53mm							
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm							
1/4" / 6.3mm							
# 4 / 4.75mm							
Retained # 4 / 4.75mm				Wt. Before Wash (W)			
PASS WET				Wt. Before Wash (D)		425	
# 4 / 4.75 DRY				Wt. After Wash		234	
Total Sample wt.				Elutriation			
# 10 / 2mm		11		2.6		< 3%	
# 18 / 1.00mm		7		1.6		< 10%	
# 35 / 500um		34		8			
# 60 / 250um		45		11		#35 + # 60 > 60%	
# 100 / 150um		53		12.5		< 20%	
# 140 / 106um		32		7.5		% Org (A - B / A x 100)	
# 270 / 53 UM		49		11.5		#140 + # 270 < 5%	
PASS		3		0.7		< 3 %	
# 270 / 53um							
Total - # 4 Split		234					
TESTED BY:		BL		DATE TESTED:		4-Sep-07	
REVIEWED BY:		BL		DATE REVIEWED:		4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0035735				Fine Sieve Factor = 0.0953900		Sive Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		7490	27	73		(A) Liquid Limit	
1" / 25mm		3068	11	62		(B) Plastic Limit	
3/4" / 19mm		2540	9	53		P.I. = (A - B)	
1/2" / 12.5mm		2234	8	45		SPECIFIC GRAVITY	
3/8" / 9.5mm		1589	6	40		Weight in Water (a) %	
1/4" / 6.3mm		1476	5	34		SSD Weight (b)	
# 4 / 4.75mm		778	3	31		Oven Dry Weight ©	
Retained # 4 / 4.75mm		19175	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		330	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		8809	Wt. After Wash		219	MOISTURE SAMPLE	
Total Sample Weight		27984	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		22	2	29		(b) Dry Weight 0	
#10 / 2mm		10	1	28		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		16	2	27		COMMENTS	
#30 / 600um		24	2	25			
#40 / 425um		20	2	23			
#50 / 300um		18	2	21			
#100 / 150um		52	5	16		SAMPLE # 7	
#200 / 75um		48	4.6			100 ACRE SITE	
PASS		9		11.4			
# 200 / 75um							
Total - # 4 Split		219					
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.303030303		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric				FM		Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm			100	F.M.		Weight in Water (a)	
1/4" / 6.3mm						%	
# 4 / 4.75mm	0	0	100	0		SSD Weight (b)	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				Oven Dry Weight ©	
PASS WET		Wt. Before Wash (D)		330		Sp. Gravity = c / (b-a)	
# 4 / 4.75 DRY		Wt. After Wash		219		% Absorption = (b-c) / c	
Total Sample Weight		Elutriation				MOISTURE SAMPLE	
# 8 / 2.36mm	22	7	93	7		(a) Wet Weight	
#10 / 2mm	10	3	90			0	
#16 / 1.18mm	16	5	85	15		(b) Dry Weight	
#30 / 600um	24	7	78	22		0	
#40 / 425um	20	6	72			% Moisture (a-b / a * 100)	
#50 / 300um	18	5	67	33		#DIV/0!	
#100 / 150um	52	16	51	49		COMMENTS	
#200 / 75um	48	14.5					
PASS	9		36.4				
# 200 / 75um				1.25		SE =	
Total - # 4 Split	219						
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.303030303		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm						SILT & CLAYS	
3/8" / 9.5mm						MAT'L	Weight
1/4" / 6.3mm						SILT	
# 4 / 4.75mm						CLAY	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				SAND	
PASS WET		Wt. Before Wash (D)		330	MOISTURE SAMPLE		
# 4 / 4.75 DRY		Wt. After Wash		206	(A) Wet Weight		
Total Sample wt.		Elutriation			(B) Dry Weight		
# 10 / 2mm		27	8.2		< 3%	% Moisture (A-B/A*100)	
# 18 / 1.00mm		17	5.2		< 10%	% ORGANIC	
# 35 / 500um		32	10			1	2
# 60 / 250um		31	9		#35 + # 60 > 60%	AVG	
# 100 / 150um		41	12.4		< 20%	(a) Wt. Before	
# 140 / 106um		26	7.9			(b) Wt. After	
# 270 / 53 UM		30	9.1		#140 + # 270 < 5%	% Org (A - B / A x 300)	
PASS		2	0.6		< 3 %	COMMENTS	
# 270 / 53um							
Total - # 4 Split		206				SAMPLE # 7	
TESTED BY:		LS	DATE TESTED:		31-Aug-07	100 ACRE SITE	
REVIEWED BY:		BL	DATE REVIEWED:		4-Sep-07		

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0083043				Fine Sieve Factor = 0.0674208		Sive Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		4302	36	64		(A) Liquid Limit	
1" / 25mm		420	3	61		(B) Plastic Limit	
3/4" / 19mm		564	5	56		P.I. = (A - B)	
1/2" / 12.5mm		1242	10	46		SPECIFIC GRAVITY	
3/8" / 9.5mm		1060	9	37		Weight in Water (a) %	
1/4" / 6.3mm		726	6	31		SSD Weight (b)	
# 4 / 4.75mm		448	4	27		Oven Dry Weight ©	
Retained # 4 / 4.75mm		8762	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		404	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		3280	Wt. After Wash		230	MOISTURE SAMPLE	
Total Sample Weight		12042	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		13	1	26		(b) Dry Weight 0	
#10 / 2mm		3	0	26		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		10	1	25		COMMENTS	
#30 / 600um		25	2	24			
#40 / 425um		24	2	22			
#50 / 300um		51	3	19			
#100 / 150um		55	4	15		SAMPLE # 8	
#200 / 75um		40	2.7			10 ACRE SITE	
PASS		9		12.3			
# 200 / 75um							
Total - # 4 Split		230					
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY:				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		31-Aug-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.247524752		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric				FM		Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm			100	F.M.		Weight in Water (a)	%
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm	0	0	100	0		Oven Dry Weight ©	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				Sp. Gravity = c / (b-a)	
PASS WET		Wt. Before Wash (D)		404		% Absorption = (b-c) / c	
# 4 / 4.75 DRY		Wt. After Wash		230		MOISTURE SAMPLE	
Total Sample Weight		Elutriation				(a) Wet Weight	0
# 8 / 2.36mm	13	3	97	3		(b) Dry Weight	0
#10 / 2mm	3	1	96			% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm	10	2	94	6		COMMENTS	
#30 / 600um	25	6	87	13			
#40 / 425um	24	6	81				
#50 / 300um	51	13	69	31		SAMPLE # 8	
#100 / 150um	55	14	55	45		10 ACRE SITE	
#200 / 75um	40	9.9					
PASS	9		45.3				
# 200 / 75um				0.98		SE =	
Total - # 4 Split	230						
TESTED BY:				BL		DATE TESTED:	
						4-Sep-07	
REVIEWED BY;				BL		DATE REVIEWED:	
						4-Sep-07	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		8/31/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.247524752		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	
Retained # 4 / 4.75mm						CLAY	
PASS WET			Wt. Before Wash (W)			SAND	
# 4 / 4.75 DRY			Wt. Before Wash (D)		404	MOISTURE SAMPLE	
Total Sample wt.			Wt. After Wash		227	(A) Wet Weight	
			Elutriation			(B) Dry Weight	
# 10 / 2mm		12	3.0		< 3%	% Moisture (A-B/A*100)	
# 18 / 1.00mm		9	2.2		< 10%	% ORGANIC	
# 35 / 500um		29	7			1	2
# 60 / 250um		36	9		#35 + # 60 > 60%	AVG	
# 100 / 150um		40	9.9		< 20%	(a) Wt. Before	
# 140 / 106um		46	11.4			(b) Wt. After	
# 270 / 53 UM		52	12.9		#140 + # 270 < 5%	% Org (A - B / A x 100)	
PASS		3	0.7		< 3 %	COMMENTS	
# 270 / 53um							
Total - # 4 Split		227				SAMPLE # 8	
TESTED BY:		BL	DATE TESTED:		4-Sep-07	10 ACRE SITE	
REVIEWED BY:		BL	DATE REVIEWED:		4-Sep-07		

Sample Batch Test Group No.2 (8 Buckets)

Test Conducted by: Fort McDowell Yavapai Materials
Date Tested: September 13, 2007
Date Reviewed: N/A

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
0.0026931				0.0708072		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor		
English / Metric					Specific Gravity		
3" / 75mm					Unit Weight		
2 1/2" / 53mm					PLASTICITY INDEX		
2" / 50mm			100			1	2
1 1/4" / 31.5mm	5868	16	84		(A) Liquid Limit		AVG
1" / 25mm	6891	19	66		(B) Plastic Limit		
3/4" / 19mm	4202	11	54		P.I. = (A - B)		
1/2" / 12.5mm	4728	13	42		SPECIFIC GRAVITY		
3/8" / 9.5mm	1798	5	37		Weight in Water (a)	%	
1/4" / 6.3mm	1396	4	33		SSD Weight (b)		
# 4 / 4.75mm	549	1	32		Oven Dry Weight ©		
Retained # 4 / 4.75mm	25432	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)		
PASS WET		Wt. Before Wash (D)		445	% Absorption = (b-c) / c		
# 4 / 4.75 DRY	11700	Wt. After Wash		389	MOISTURE SAMPLE		
Total Sample Weight	37132	Elutriation			(a) Wet Weight	0	
# 8 / 2.36mm	10	1	31		(b) Dry Weight	0	
#10 / 2mm	2	0	31		% Moisture (a-b / a * 100)	#DIV/0!	
#16 / 1.18mm	7	0	30		COMMENTS		
#30 / 600um	61	4	26				
#40 / 425um	85	6	20				
#50 / 300um	46	3	17				
#100 / 150um	129	9	7		SAMPLE # 1		
#200 / 75um	43	3.0					
PASS	6		4.4				
# 200 / 75um							
Total - # 4 Split	389						
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sive Analysis	
				0.201207243		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm						1	2
1 1/4" / 31.5mm						AVG	
1" / 25mm						(A) Liquid Limit	
3/4" / 19mm						(B) Plastic Limit	
1/2" / 12.5mm						P.I. = (A - B)	
3/8" / 9.5mm				100	F.M.	SPECIFIC GRAVITY	
1/4" / 6.3mm						Weight in Water (a)	
# 4 / 4.75mm		0	0	100	0	%	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			SSD Weight (b)	
PASS WET			Wt. Before Wash (D)		497	Oven Dry Weight ©	
# 4 / 4.75 DRY			Wt. After Wash		406	Sp. Gravity = c / (b-a)	
Total Sample Weight			Elutriation			% Absorption = (b-c) / c	
# 8 / 2.36mm		11	2	98	2	MOISTURE SAMPLE	
#10 / 2mm		3	1	97		(a) Wet Weight	
#16 / 1.18mm		8	2	96	4	(b) Dry Weight	
#30 / 600um		64	13	83	17	% Moisture (a-b / a * 100)	
#40 / 425um		88	18	65		#DIV/0!	
#50 / 300um		49	10	55	45	COMMENTS	
#100 / 150um		131	26	29	71	SAMPLE # 1	
#200 / 75um		45	9.1			SE =	
PASS		7		19.7		Total - # 4 Split	
# 200 / 75um					1.40	406	
TESTED BY:		BL			DATE TESTED:		13-Sep-07
DATE REVIEWED:							

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117					TESTS REQUIRED		
Course Sieve Factor =			Fine Sieve Factor =		Sieve Analysis		
			0.224719101		Hydrometer		
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	% Organic		
English / Metric					Silt/Clay		
3" / 75mm					Other		
2 1/2" / 53mm					HYDROMETER		
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm					SILT & CLAYS		
3/8" / 9.5mm					MAT'L	Weight	%
1/4" / 6.3mm					SILT		
# 4 / 4.75mm					CLAY		
Retained # 4 / 4.75mm		Wt. Before Wash (W)			SAND		
PASS WET		Wt. Before Wash (D)		445	MOISTURE SAMPLE		
# 4 / 4.75 DRY		Wt. After Wash		409	(A) Wet Weight		
Total Sample wt.		Elutriation			(B) Dry Weight		
# 10 / 2mm	12	2.7		< 3%	% Moisture (A-B/A*100)		
# 18 / 1.00mm	11	2.5		< 10%	% ORGANIC		
# 35 / 500um	101	23			1	2	AVG
# 60 / 250um	144	32		#35 + # 60 > 60%	(a) Wt. Before		
# 100 / 150um	90	20.2		< 20%	(b) Wt. After		
# 140 / 106um	28	6.3			% Org (A - B / A x 100)		
# 270 / 53 UM	22	4.9		#140 + # 270 < 5%	COMMENTS		
PASS	1	0.2		< 3 %			
# 270 / 53um							
Total - # 4 Split	409				SAMPLE # 1		
TESTED BY:	BL	DATE TESTED:		13-Sep-07			
REVIEWED BY:		DATE REVIEWED:					

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0034561				Fine Sieve Factor = 0.0441693		Sieve Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		8640	30	70		(A) Liquid Limit	
1" / 25mm		5436	19	51		(B) Plastic Limit	
3/4" / 19mm		3011	10	41		P.I. = (A - B)	
1/2" / 12.5mm		2240	8	33		SPECIFIC GRAVITY	
3/8" / 9.5mm		1961	7	26		Weight in Water (a) %	
1/4" / 6.3mm		1310	5	22		SSD Weight (b)	
# 4 / 4.75mm		470	2	20		Oven Dry Weight ©	
Retained # 4 / 4.75mm		23068	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		459	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		5866	Wt. After Wash		328	MOISTURE SAMPLE	
Total Sample Weight		28934	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		20	1	19		(b) Dry Weight 0	
#10 / 2mm		6	0	19		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		16	1	18		COMMENTS	
#30 / 600um		70	3	15			
#40 / 425um		58	3	13			
#50 / 300um		31	1	11			
#100 / 150um		59	3	9		SAMPLE # 2	
#200 / 75um		57	2.5				
PASS		11		6.3			
# 200 / 75um							
Total - # 4 Split		328					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.217864924		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a) %	
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		459	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		328	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		20	4	96		(b) Dry Weight 0	
#10 / 2mm		6	1	94		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		16	3	91		COMMENTS	
#30 / 600um		70	15	76			
#40 / 425um		58	13	63			
#50 / 300um		31	7	56		SAMPLE # 2	
#100 / 150um		59	13	43			
#200 / 75um		57	12.4				
PASS		11		30.9			
# 200 / 75um						SE =	
Total - # 4 Split		328					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117					TESTS REQUIRED		
Course Sieve Factor =			Fine Sieve Factor =		Sieve Analysis		
			0.217864924		Hydrometer		
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	% Organic		
English / Metric					Silt/Clay		
3" / 75mm					Other		
2 1/2" / 53mm					HYDROMETER		
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm					SILT & CLAYS		
3/8" / 9.5mm					MAT'L	Weight	%
1/4" / 6.3mm					SILT		
# 4 / 4.75mm					CLAY		
Retained # 4 / 4.75mm		Wt. Before Wash (W)			SAND		
PASS WET		Wt. Before Wash (D)		459	MOISTURE SAMPLE		
# 4 / 4.75 DRY		Wt. After Wash		329	(A) Wet Weight		
Total Sample wt.		Elutriation			(B) Dry Weight		
# 10 / 2mm	26	5.7		< 3%	% Moisture (A-B/A*100)		
# 18 / 1.00mm	22	4.8		< 10%	% ORGANIC		
# 35 / 500um	99	22			1	2	AVG
# 60 / 250um	67	15		#35 + # 60 > 60%	(a) Wt. Before		
# 100 / 150um	46	10.0		< 20%	(b) Wt. After		
# 140 / 106um	29	6.3			% Org (A - B / A x 100)		
# 270 / 53 UM	39	8.5		#140 + # 270 < 5%	COMMENTS		
PASS	1	0.2		< 3 %			
# 270 / 53um							
Total - # 4 Split	329				SAMPLE # 2		
TESTED BY:	BL	DATE TESTED:		13-Sep-07			
REVIEWED BY:		DATE REVIEWED:					

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0037504				Fine Sieve Factor = 0.0608662		Sieve Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		5205	20	80		(A) Liquid Limit	
1" / 25mm		2911	11	70		(B) Plastic Limit	
3/4" / 19mm		3340	13	57		P.I. = (A - B)	
1/2" / 12.5mm		2046	8	49		SPECIFIC GRAVITY	
3/8" / 9.5mm		2270	9	41		Weight in Water (a) %	
1/4" / 6.3mm		1840	7	34		SSD Weight (b)	
# 4 / 4.75mm		986	4	30		Oven Dry Weight ©	
Retained # 4 / 4.75mm		18598	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		497	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		8066	Wt. After Wash		430	MOISTURE SAMPLE	
Total Sample Weight		26664	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		42	3	28		(b) Dry Weight 0	
#10 / 2mm		8	0	27		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		18	1	26		COMMENTS	
#30 / 600um		91	6	21			
#40 / 425um		85	5	15			
#50 / 300um		43	3	13			
#100 / 150um		76	5	8		SAMPLE # 3	
#200 / 75um		56	3.4				
PASS		11		4.7			
# 200 / 75um							
Total - # 4 Split		430					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sive Analysis	
				0.217864924		Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm						1	2
1 1/4" / 31.5mm						AVG	
1" / 25mm						(A) Liquid Limit	
3/4" / 19mm						(B) Plastic Limit	
1/2" / 12.5mm						P.I. = (A - B)	
3/8" / 9.5mm			100		F.M.	SPECIFIC GRAVITY	
1/4" / 6.3mm						Weight in Water (a)	
# 4 / 4.75mm	0	0	100		0	%	
Retained # 4 / 4.75mm		Wt. Before Wash (W)				SSD Weight (b)	
PASS WET		Wt. Before Wash (D)		459		Oven Dry Weight ©	
# 4 / 4.75 DRY		Wt. After Wash		430		Sp. Gravity = c / (b-a)	
Total Sample Weight		Elutriation				% Absorption = (b-c) / c	
# 8 / 2.36mm	42	9	91			MOISTURE SAMPLE	
#10 / 2mm	8	2	89			(a) Wet Weight	
#16 / 1.18mm	18	4	85			(b) Dry Weight	
#30 / 600um	91	20	65			% Moisture (a-b / a * 100)	
#40 / 425um	85	19	47			#DIV/0!	
#50 / 300um	43	9	37			COMMENTS	
#100 / 150um	76	17	21				
#200 / 75um	56	12.2					
PASS	11		8.7				
# 200 / 75um						SE =	
Total - # 4 Split	430						
TESTED BY:				DATE TESTED:			
BL				13-Sep-07			
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.224719101		Hydrometer	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs	% Organic		
English / Metric					Silt/Clay		
3" / 75mm					Other		
2 1/2" / 53mm					HYDROMETER		
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm					SILT & CLAYS		
3/8" / 9.5mm					MAT'L	Weight	%
1/4" / 6.3mm					SILT		
# 4 / 4.75mm					CLAY		
Retained # 4 / 4.75mm		Wt. Before Wash (W)			SAND		
PASS WET		Wt. Before Wash (D)		445	MOISTURE SAMPLE		
# 4 / 4.75 DRY		Wt. After Wash		438	(A) Wet Weight		
Total Sample wt.		Elutriation			(B) Dry Weight		
# 10 / 2mm	51	11.5		< 3%	% Moisture (A-B/A*100)		
# 18 / 1.00mm	26	5.8		< 10%	% ORGANIC		
# 35 / 500um	137	31			1	2	AVG
# 60 / 250um	96	22		#35 + # 60 > 60%	(a) Wt. Before		
# 100 / 150um	59	13.3		< 20%	(b) Wt. After		
# 140 / 106um	32	7.2			% Org (A - B / A x 100)		
# 270 / 53 UM	34	7.6		#140 + # 270 < 5%	COMMENTS		
PASS	3	0.7		< 3 %			
# 270 / 53um							
Total - # 4 Split	438				SAMPLE # 3		
TESTED BY:	BL	DATE TESTED:		13-Sep-07			
REVIEWED BY:		DATE REVIEWED:					

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0031748				Fine Sieve Factor = 0.0862149		Sieve Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		8509	27	73		(A) Liquid Limit	33
1" / 25mm		2960	9	64		(B) Plastic Limit	26
3/4" / 19mm		3042	10	54		P.I. = (A - B)	7
1/2" / 12.5mm		1861	6	48		SPECIFIC GRAVITY	
3/8" / 9.5mm		1770	6	42		Weight in Water (a)	%
1/4" / 6.3mm		1006	3	39		SSD Weight (b)	
# 4 / 4.75mm		510	2	38		Oven Dry Weight ©	
Retained # 4 / 4.75mm		19658	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		436	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		11840	Wt. After Wash		293	MOISTURE SAMPLE	
Total Sample Weight		31498	Elutriation			(a) Wet Weight	0
# 8 / 2.36mm		21	2	36		(b) Dry Weight	0
#10 / 2mm		6	1	35		% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm		13	1	34		COMMENTS	
#30 / 600um		56	5	29			
#40 / 425um		46	4	25			
#50 / 300um		25	2	23			
#100 / 150um		57	5	18		SAMPLE # 4	
#200 / 75um		59	5.1				
PASS		10		13.2			
# 200 / 75um							
Total - # 4 Split		293					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.217864924		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm							1 2 AVG
1 1/4" / 31.5mm						(A) Liquid Limit	33
1" / 25mm						(B) Plastic Limit	26
3/4" / 19mm						P.I. = (A - B)	7
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a)	%
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		459	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		293	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight	0
# 8 / 2.36mm		21	5	95		(b) Dry Weight	0
#10 / 2mm		6	1	94		% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm		13	3	91		COMMENTS	
#30 / 600um		56	12	79			
#40 / 425um		46	10	69			
#50 / 300um		25	5	64		SAMPLE # 4	
#100 / 150um		57	12	51			
#200 / 75um		59	12.9				
PASS		10		38.3			
# 200 / 75um						SE =	
Total - # 4 Split		293					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.224719101		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm						SILT & CLAYS	
3/8" / 9.5mm						MAT'L	Weight
1/4" / 6.3mm						SILT	
# 4 / 4.75mm						CLAY	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			SAND	
PASS WET			Wt. Before Wash (D)		445	MOISTURE SAMPLE	
# 4 / 4.75 DRY			Wt. After Wash		294	(A) Wet Weight	
Total Sample wt.			Elutriation			(B) Dry Weight	
# 10 / 2mm		26	5.8		< 3%	% Moisture (A-B/A*100)	
# 18 / 1.00mm		19	4.3		< 10%	% ORGANIC	
# 35 / 500um		78	18			1	2
# 60 / 250um		55	12		#35 + # 60 > 60%	AVG	
# 100 / 150um		46	10.3		< 20%	(a) Wt. Before	
# 140 / 106um		30	6.7			(b) Wt. After	
						% Org (A - B / A x 100)	
# 270 / 53 UM		39	8.8		#140 + # 270 < 5%	COMMENTS	
PASS		1	0.2		< 3 %		
# 270 / 53um							
Total - # 4 Split		294				SAMPLE # 4	
TESTED BY:		BL	DATE TESTED:		13-Sep-07		
REVIEWED BY:			DATE REVIEWED:				

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0030338				Fine Sieve Factor = 0.0583053		Sieve Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100		1	2
1 1/4" / 31.5mm		8199	25	75		(A) Liquid Limit	
1" / 25mm		5006	15	60		(B) Plastic Limit	
3/4" / 19mm		3797	12	48		P.I. = (A - B)	
1/2" / 12.5mm		3140	10	39		SPECIFIC GRAVITY	
3/8" / 9.5mm		2061	6	33		Weight in Water (a) %	
1/4" / 6.3mm		2044	6	26		SSD Weight (b)	
# 4 / 4.75mm		1066	3	23		Oven Dry Weight ©	
Retained # 4 / 4.75mm		25313	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		398	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		7649	Wt. After Wash		346	MOISTURE SAMPLE	
Total Sample Weight		32962	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		9	1	23		(b) Dry Weight 0	
#10 / 2mm		2	0	23		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		11	1	22		COMMENTS	
#30 / 600um		46	3	19			
#40 / 425um		75	4	15			
#50 / 300um		50	3	12			
#100 / 150um		110	6	6		SAMPLE # 5	
#200 / 75um		38	2.2				
PASS		5		3.3			
# 200 / 75um							
Total - # 4 Split		346					
TESTED BY:				BL			
DATE TESTED:				13-Sep-07			
DATE REVIEWED:							

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.251256281		Plasticity Index	
Sieve Size		Wt. Ret.		% Retained		% Passing	
English / Metric						Specs	
						FM	
3" / 75mm						Standard Proctor	
2 1/2" / 53mm						Specific Gravity	
2" / 50mm						Unit Weight	
1 1/4" / 31.5mm						PLASTICITY INDEX	
1" / 25mm						1 2 AVG	
3/4" / 19mm						(A) Liquid Limit	
1/2" / 12.5mm						(B) Plastic Limit	
3/8" / 9.5mm				100		P.I. = (A - B)	
1/4" / 6.3mm						SPECIFIC GRAVITY	
# 4 / 4.75mm		0		0		100	
Retained # 4 / 4.75mm				Wt. Before Wash (W)		Weight in Water (a)	
PASS WET				Wt. Before Wash (D)		SSD Weight (b)	
# 4 / 4.75 DRY				Wt. After Wash		Oven Dry Weight ©	
Total Sample Weight				Elutriation		Sp. Gravity = c / (b-a)	
# 8 / 2.36mm		9		2		% Absorption = (b-c) / c	
#10 / 2mm		2		1		MOISTURE SAMPLE	
#16 / 1.18mm		11		3		(a) Wet Weight	
#30 / 600um		46		12		(b) Dry Weight	
#40 / 425um		75		19		% Moisture (a-b / a * 100)	
#50 / 300um		50		13		#DIV/0!	
#100 / 150um		110		28		COMMENTS	
#200 / 75um		38		9.5			
PASS		5		14.3		SAMPLE # 5	
# 200 / 75um							
Total - # 4 Split		346				SE =	
TESTED BY:				BL			
DATE TESTED:				13-Sep-07			
DATE REVIEWED:							

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.251256281		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	
Retained # 4 / 4.75mm						CLAY	
						SAND	
PASS WET			Wt. Before Wash (W)			MOISTURE SAMPLE	
# 4 / 4.75 DRY			Wt. Before Wash (D)		398	(A) Wet Weight	
Total Sample wt.			Wt. After Wash		346	(B) Dry Weight	
			Elutriation			% Moisture (A-B/A*100)	
# 10 / 2mm		10	2.5		< 3%		
# 18 / 1.00mm		14	3.5		< 10%	% ORGANIC	
# 35 / 500um		106	27			1	2
# 60 / 250um		121	30		#35 + # 60 > 60%	AVG	
# 100 / 150um		59	14.8		< 20%	(a) Wt. Before	
# 140 / 106um		20	5.0			(b) Wt. After	
# 270 / 53 UM		15	3.8		#140 + # 270 < 5%	% Org (A - B / A x 100)	
PASS		1	0.3		< 3 %	COMMENTS	
# 270 / 53um							
Total - # 4 Split		346				SAMPLE # 5	
TESTED BY:		BL	DATE TESTED:		13-Sep-07		
REVIEWED BY:			DATE REVIEWED:				

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0029230				Fine Sieve Factor = 0.0718286		Sieve Analysis	
						Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm				100			1 2 AVG
1 1/4" / 31.5mm		5614	16	84		(A) Liquid Limit	
1" / 25mm		4753	14	70		(B) Plastic Limit	
3/4" / 19mm		4086	12	58		P.I. = (A - B)	
1/2" / 12.5mm		5134	15	43		SPECIFIC GRAVITY	
3/8" / 9.5mm		1679	5	38		Weight in Water (a) %	
1/4" / 6.3mm		1540	5	33		SSD Weight (b)	
# 4 / 4.75mm		446	1	32		Oven Dry Weight ©	
Retained # 4 / 4.75mm		23252	Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		446	% Absorption = (b-c) / c	
# 4 / 4.75 DRY		10960	Wt. After Wash		380	MOISTURE SAMPLE	
Total Sample Weight		34212	Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		12	1	31		(b) Dry Weight 0	
#10 / 2mm		6	0	31		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		20	1	29		COMMENTS	
#30 / 600um		56	4	25			
#40 / 425um		66	5	21			
#50 / 300um		50	4	17			
#100 / 150um		108	8	9		SAMPLE # 6	
#200 / 75um		58	4.2				
PASS		4		5.0			
# 200 / 75um							
Total - # 4 Split		380					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL: RAW MATERIAL				DATE SAMPLED: 12-Sep-07			
SAMPLE SOURCE: NEW MEXICO				SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =			Fine Sieve Factor =			Sieve Analysis	
			0.224215247			Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm						1	2
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a) %	
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		446	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		380	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight 0	
# 8 / 2.36mm		12	3	97		(b) Dry Weight 0	
#10 / 2mm		6	1	96		% Moisture (a-b / a * 100) #DIV/0!	
#16 / 1.18mm		20	4	91		COMMENTS	
#30 / 600um		56	13	79			
#40 / 425um		66	15	64			
#50 / 300um		50	11	53		SAMPLE # 6	
#100 / 150um		108	24	29			
#200 / 75um		58	13.0				
PASS		4		15.7			
# 200 / 75um						SE =	
Total - # 4 Split		380					
TESTED BY: BL				DATE TESTED: 13-Sep-07			
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.224215247		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	
Retained # 4 / 4.75mm						CLAY	
PASS WET			Wt. Before Wash (W)			SAND	
# 4 / 4.75 DRY			Wt. Before Wash (D)		446	MOISTURE SAMPLE	
Total Sample wt.			Wt. After Wash		380	(A) Wet Weight	
			Elutriation			(B) Dry Weight	
# 10 / 2mm		12	2.7		< 3%	% Moisture (A-B/A*100)	
# 18 / 1.00mm		20	4.5		< 10%	% ORGANIC	
# 35 / 500um		110	25			1	2
# 60 / 250um		124	28		#35 + # 60 > 60%	AVG	
# 100 / 150um		74	16.6		< 20%	(a) Wt. Before	
# 140 / 106um		22	4.9			(b) Wt. After	
# 270 / 53 UM		16	3.6		#140 + # 270 < 5%	% Org (A - B / A x 100)	
PASS		2	0.4		< 3 %	COMMENTS	
# 270 / 53um							
Total - # 4 Split		380				SAMPLE # 6	
TESTED BY:		BL	DATE TESTED:		13-Sep-07		
REVIEWED BY:			DATE REVIEWED:				

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL: RAW MATERIAL		DATE SAMPLED: 12-Sep-07	
SAMPLE SOURCE: NEW MEXICO		SUBMITTED BY:	
GRADATION ASTM C-136 & ASTM C-117			TESTS REQUIRED
Course Sieve Factor = 0.0034790		Fine Sieve Factor = 0.0981470	
Sieve Size	Wt. Ret.	% Retained	% Passing
English / Metric			
3" / 75mm			
2 1/2" / 53mm			
2" / 50mm			100
1 1/4" / 31.5mm	2186	8	92
1" / 25mm	5466	19	73
3/4" / 19mm	2890	10	63
1/2" / 12.5mm	1447	5	58
3/8" / 9.5mm	1298	5	54
1/4" / 6.3mm	1066	4	50
# 4 / 4.75mm	511	2	48
Retained # 4 / 4.75mm	14864	Wt. Before Wash (W)	
PASS WET		Wt. Before Wash (D) 492	
# 4 / 4.75 DRY	13880	Wt. After Wash 431	
Total Sample Weight	28744	Elutriation	
# 8 / 2.36mm	8	1	48
#10 / 2mm	8	1	47
#16 / 1.18mm	10	1	46
#30 / 600um	75	7	38
#40 / 425um	90	9	30
#50 / 300um	54	5	24
#100 / 150um	121	12	12
#200 / 75um	58	5.7	
PASS	7		6.7
# 200 / 75um			
Total - # 4 Split	431		
TESTED BY: BL		DATE TESTED: 13-Sep-07	
		DATE REVIEWED:	

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.203252033		Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm						1	2
1 1/4" / 31.5mm						(A) Liquid Limit	
1" / 25mm						(B) Plastic Limit	
3/4" / 19mm						P.I. = (A - B)	
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a)	
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)		492	% Absorption = (b-c) / c	
# 4 / 4.75 DRY			Wt. After Wash		431	MOISTURE SAMPLE	
Total Sample Weight			Elutriation			(a) Wet Weight	
# 8 / 2.36mm		8	2	98	2	(b) Dry Weight	
#10 / 2mm		8	2	97		% Moisture (a-b / a * 100)	
#16 / 1.18mm		10	2	95	5	#DIV/0!	
#30 / 600um		75	15	79	21	COMMENTS	
#40 / 425um		90	18	61			
#50 / 300um		54	11	50	50	SAMPLE # 7	
#100 / 150um		121	25	26	74		
#200 / 75um		58	11.8				
PASS		7		13.8			
# 200 / 75um					1.52	SE =	
Total - # 4 Split		431					
TESTED BY:				BL		DATE TESTED:	
						13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.203252033		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	%
Retained # 4 / 4.75mm						CLAY	
PASS WET			Wt. Before Wash (W)			SAND	
PASS DRY			Wt. Before Wash (D)	492		MOISTURE SAMPLE	
# 4 / 4.75 DRY			Wt. After Wash	432		(A) Wet Weight	
Total Sample wt.			Elutriation			(B) Dry Weight	
# 10 / 2mm	16	3.3		< 3%		% Moisture (A-B/A*100)	
# 18 / 1.00mm	13	2.6		< 10%		% ORGANIC	
# 35 / 500um	120	24				1	2
# 60 / 250um	144	29		#35 + # 60 > 60%		AVG	
# 100 / 150um	96	19.5		< 20%	(a) Wt. Before		
# 140 / 106um	24	4.9			(b) Wt. After		
# 270 / 53 UM	18	3.7		#140 + # 270 < 5%	% Org (A - B / A x 100)		
PASS	1	0.2		< 3 %	COMMENTS		
# 270 / 53um							
Total - # 4 Split	432				SAMPLE # 7		
TESTED BY:	BL	DATE TESTED:		13-Sep-07			
REVIEWED BY:		DATE REVIEWED:					

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor = 0.0034355				Fine Sieve Factor = 0.0393533		Sieve Analysis	
						Plasticity Index	
Sieve Size	Wt. Ret.	% Retained	% Passing	Specs		Standard Proctor	
English / Metric						Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm			100				1 2 AVG
1 1/4" / 31.5mm	9904	34	66			(A) Liquid Limit	25
1" / 25mm	4690	16	50			(B) Plastic Limit	22
3/4" / 19mm	3876	13	37			P.I. = (A - B)	3
1/2" / 12.5mm	2420	8	28			SPECIFIC GRAVITY	
3/8" / 9.5mm	1452	5	23			Weight in Water (a)	%
1/4" / 6.3mm	1266	4	19			SSD Weight (b)	
# 4 / 4.75mm	540	2	17			Oven Dry Weight ©	
Retained # 4 / 4.75mm	24148	Wt. Before Wash (W)				Sp. Gravity = c / (b-a)	
PASS WET		Wt. Before Wash (D)		433		% Absorption = (b-c) / c	
# 4 / 4.75 DRY	4960	Wt. After Wash		379		MOISTURE SAMPLE	
Total Sample Weight	29108	Elutriation				(a) Wet Weight	0
# 8 / 2.36mm	18	1	16			(b) Dry Weight	0
#10 / 2mm	8	0	16			% Moisture (a-b / a * 100)	#DIV/0!
#16 / 1.18mm	22	1	15			COMMENTS	
#30 / 600um	74	3	12				
#40 / 425um	60	2	10				
#50 / 300um	36	1	8				
#100 / 150um	71	3	6			SAMPLE # 8	
#200 / 75um	80	3.1					
PASS	10		2.5				
# 200 / 75um							
Total - # 4 Split	379						
TESTED BY:		BL		DATE TESTED:		13-Sep-07	
				DATE REVIEWED:			

FORT MCDOWELL YAVAPAI MATERIALS

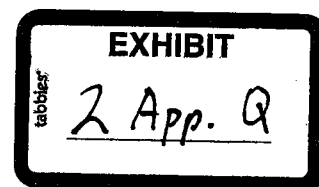
Quality Control - Soil & Aggregate Tabulation Record

TYPE MATERIAL:		RAW MATERIAL		DATE SAMPLED:		12-Sep-07	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =			Fine Sieve Factor =			Sieve Analysis	
			0.230946882			Plasticity Index	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	Standard Proctor	
English / Metric					FM	Specific Gravity	
3" / 75mm						Unit Weight	
2 1/2" / 53mm						PLASTICITY INDEX	
2" / 50mm						1	2
1 1/4" / 31.5mm						(A) Liquid Limit	25
1" / 25mm						(B) Plastic Limit	22
3/4" / 19mm						P.I. = (A - B)	3
1/2" / 12.5mm						SPECIFIC GRAVITY	
3/8" / 9.5mm				100	F.M.	Weight in Water (a)	
1/4" / 6.3mm						SSD Weight (b)	
# 4 / 4.75mm		0	0	100	0	Oven Dry Weight ©	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			Sp. Gravity = c / (b-a)	
PASS WET			Wt. Before Wash (D)			433	
# 4 / 4.75 DRY			Wt. After Wash			379	
Total Sample Weight			Elutriation			(a) Wet Weight	
# 8 / 2.36mm		18	4	96		(b) Dry Weight	
#10 / 2mm		8	2	94		% Moisture (a-b / a * 100)	
#16 / 1.18mm		22	5	89		#DIV/0!	
#30 / 600um		74	17	72		COMMENTS	
#40 / 425um		60	14	58			
#50 / 300um		36	8	50		SAMPLE # 8	
#100 / 150um		71	16	33			
#200 / 75um		80	18.5				
PASS		10		14.8			
# 200 / 75um						SE =	
Total - # 4 Split		379					
TESTED BY:				BL			
DATE TESTED:				13-Sep-07			
DATE REVIEWED:							

FORT MCDOWELL YAVAPAI MATERIALS

Quality Control - Soil & Aggregate Tabulation Record - USGA Specifications

TYPE OF MATERIAL:		RAW MATERIAL		DATE/TIME SAMPLED		9/12/2007	
SAMPLE SOURCE:		NEW MEXICO		SUBMITTED BY:			
GRADATION ASTM C-136 & ASTM C-117						TESTS REQUIRED	
Course Sieve Factor =				Fine Sieve Factor =		Sieve Analysis	
				0.230946882		Hydrometer	
Sieve Size		Wt. Ret.	% Retained	% Passing	Specs	% Organic	
English / Metric						Silt/Clay	
3" / 75mm						Other	
2 1/2" / 53mm						HYDROMETER	
2" / 50mm							
1 1/4" / 31.5mm							
1" / 25mm							
3/4" / 19mm							
1/2" / 12.5mm							
3/8" / 9.5mm						SILT & CLAYS	
1/4" / 6.3mm						MAT'L	Weight
# 4 / 4.75mm						SILT	
						CLAY	
Retained # 4 / 4.75mm			Wt. Before Wash (W)			SAND	
PASS WET			Wt. Before Wash (D)		433	MOISTURE SAMPLE	
# 4 / 4.75 DRY			Wt. After Wash		379	(A) Wet Weight	
Total Sample wt.			Elutriation			(B) Dry Weight	
# 10 / 2mm		30	6.9		< 3%	% Moisture (A-B/A*100)	
# 18 / 1.00mm		26	6.0		< 10%	% ORGANIC	
# 35 / 500um		108	25			1	2
# 60 / 250um		75	17		#35 + # 60 > 60%	(a) Wt. Before	AVG
# 100 / 150um		58	13.4		< 20%	(b) Wt. After	
# 140 / 106um		36	8.3			% Org (A - B / A x 100)	
# 270 / 53 UM		44	10.2		#140 + # 270 < 5%	COMMENTS	
PASS		2	0.5		< 3 %		
# 270 / 53um							
Total - # 4 Split		379				SAMPLE # 8	
TESTED BY:		BL	DATE TESTED:		13-Sep-07		
REVIEWED BY:			DATE REVIEWED:				



Appendix Q Lease and Access Road ROW

SAN JUAN SAND & GRAVEL PROJECT

Appendix P Lease and Access Road ROW

SAN JUAN SAND & GRAVEL PROJECT

Document No. 007629Date Issued: 02/27/2017**EXECUTIVE OFFICIAL REVIEW**Title of Document: LWD/Lease, San Juan S&G, LLC Contact Name: YAZZIE, ELERINA BProgram/Division: DIVISION OF NATURAL RESOURCESEmail: michellehoskie@frontier.com Phone Number: 928/871/6447☐ **Business Site Lease** Sufficient Insufficient

- | | | | |
|---|-------------|---|---|
| 1. Division: _____ | Date: _____ | ☐ | ☐ |
| 2. Office of the Controller: _____ | Date: _____ | ☐ | ☐ |
| (only if Procurement Clearance is not issued within 30 days of the initiation of the E.O. review) | | | |
| 3. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Business and Industrial Development Financing, Veteran Loans, (i.e. Loan, Loan Guarantee and Investment) or Delegation of Approving and/or Management Authority of Leasing transactions**

- | | | | |
|--|-------------|---|---|
| 1. Division: _____ | Date: _____ | ☐ | ☐ |
| 2. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Fund Management Plan, Expenditure Plans, Carry Over Requests, Budget Modifications**

- | | | | |
|---|-------------|---|---|
| 1. Office of Management and Budget: _____ | Date: _____ | ☐ | ☐ |
| 2. Office of the Controller: _____ | Date: _____ | ☐ | ☐ |
| 3. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Navajo Housing Authority Request for Release of Funds**

- | | | | |
|--|-------------|---|---|
| 1. NNEPA: _____ | Date: _____ | ☐ | ☐ |
| 2. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Lease Purchase Agreements**

- | | | | |
|--|-------------|---|---|
| 1. Office of the Controller: _____ | Date: _____ | ☐ | ☐ |
| (recommendation only) | | | |
| 2. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Grant Applications**

- | | | | |
|---|-------------|---|---|
| 1. Office of Management and Budget: _____ | Date: _____ | ☐ | ☐ |
| 2. Office of the Controller: _____ | Date: _____ | ☐ | ☐ |
| 3. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Five Management Plan of the Local Governance Act, Delegation of an Approving Authority from a Standing Committee, Local Ordinances (Local Government Units), or Plans of Operation/Division Policies Requiring Committee Approval**

- | | | | |
|--|-------------|---|---|
| 1. Division: _____ | Date: _____ | ☐ | ☐ |
| 2. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Relinquishment of Navajo Membership**

- | | | | |
|--|-------------|---|---|
| 1. Land Department: _____ | Date: _____ | ☐ | ☐ |
| 2. Elections: _____ | Date: _____ | ☐ | ☐ |
| 3. Office of the Attorney General: _____ | Date: _____ | ☐ | ☐ |

☐ **Land Withdrawal or Relinquishment for Commercial Purposes**

Sufficient Insufficient

1. Division: _____ Date: _____ ☐ ☐
2. Office of the Attorney General: _____ Date: _____ ☐ ☐

☐ **Land Withdrawals for Non-Commercial Purposes, General Land Leases and Resource Leases**

1. NLD _____ Date: _____ ☐ ☐
2. F&W _____ Date: _____ ☐ ☐
3. HPD _____ Date: _____ ☐ ☐
4. Minerals _____ Date: _____ ☐ ☐
5. NNEPA _____ Date: _____ ☐ ☐
6. DNR _____ Date: _____ ☐ ☐
7. DOJ _____ Date: _____ ☐ ☐

☐ **Rights of Way**

1. NLD _____ Date: _____ ☐ ☐
2. F&W _____ Date: _____ ☐ ☐
3. HPD _____ Date: _____ ☐ ☐
4. Minerals _____ Date: _____ ☐ ☐
5. NNEPA _____ Date: _____ ☐ ☐
6. Office of the Attorney General: _____ Date: _____ ☐ ☐
7. OPVP _____ Date: _____ ☐ ☐

☐ **Oil and Gas Prospecting Permits, Drilling and Exploration Permits, Mining Permit, Mining Lease**

1. Minerals _____ Date: _____ ☐ ☐
2. OPVP _____ Date: _____ ☐ ☐
3. NLD _____ Date: _____ ☐ ☐

☐ **Assignment of Mineral Lease**

1. Minerals _____ Date: _____ ☐ ☐
2. DNR _____ Date: _____ ☐ ☐
3. DOJ _____ Date: _____ ☐ ☐

☐ **ROW (where there has been no delegation of authority to the Navajo Land Department to grant the Nation's consent to a ROW)**

1. NLD _____ Date: _____ ☐ ☐
2. F&W _____ Date: _____ ☐ ☐
3. HPD _____ Date: _____ ☐ ☐
4. Minerals _____ Date: _____ ☐ ☐
5. NNEPA _____ Date: _____ ☐ ☐
6. DNR _____ Date: _____ ☐ ☐
7. DOJ _____ Date: _____ ☐ ☐
8. OPVP _____ Date: _____ ☐ ☐

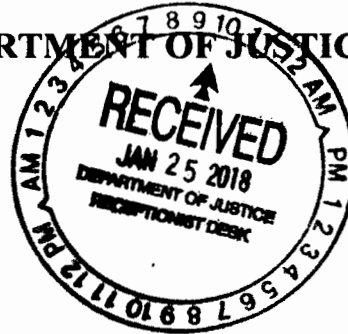
☒ **OTHER: Sand and Gravel Lease**

1. Navajo Land Dept. _____ Date: _____ ☐ ☐
2. Minerals _____ Date: _____ ☐ ☐
3. HHPD _____ Date: _____ ☐ ☐
4. Fish & Wildlife _____ Date: _____ ☐ ☐
5. Dept. Water Resources _____ Date: _____ ☐ ☐
6. Division of Natural Res. _____ Date: _____ ☐ ☐
7. NNEPA _____ Date: _____ ☐ ☐
8. DOT - (ic) _____ Date: 1/30/18 ☒ ☐
9. OPVP _____ Date: 2-6-18 ☒ ☐



NAVAJO NATION DEPARTMENT OF JUSTICE

DOCUMENT REVIEW REQUEST FORM



☐ RESUBMITTAL


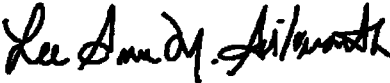



DOJ	
01-25-18 @ 945a-	
DATE / TIME	
<input type="checkbox"/> 7 Day Deadline	
DOC #:	007629
SAS #:	
UNIT:	NRR

*** FOR NNDOJ USE ONLY - DO NOT CHANGE OR REVISE FORM. VARIATIONS OF THIS FORM WILL NOT BE ACCEPTED. ***

CLIENT TO COMPLETE			
DATE OF REQUEST:	1/25/2018	DIVISION:	NATURAL RESOURCES
CONTACT NAME:	Michelle Hoskie or Stevie Hudson	DEPARTMENT:	GENERAL LAND DEVELOPMENT DEPARTMENT
PHONE NUMBER:	x 6447	E-MAIL:	steviehudson@frontier.com
TITLE OF DOCUMENT: SAN JUAN LLC, SAND AND GRAVEL LEASE			
DOJ SECRETARY TO COMPLETE			
DATE/TIME IN UNIT:	1.25.18 11:05 am	REVIEWING ATTORNEY/ADVOCATE:	Kevin Chee 2.5.18
DATE TIME OUT OF UNIT:	1.30.18 @ 450		
DOJ ATTORNEY / ADVOCATE COMMENTS			
Document is legally sufficient.			
REVIEWED BY: (Print)	Date / Time	SURNAMED BY: (Print)	Date / Time
Trumme	1-30-18	Blackhat	1/30/18 1:50pm
DOJ Secretary Called: Michelle for Document Pick Up on 1.30.18 at 440 By: [Signature]			
PICKED UP BY: (Print)		DATE / TIME:	

NNDOJ/DRRF-July 2013

COMPLETED

User Name (Facility)	Job Title	Department	Vote Cast	Comments	Replies	Vote Date	Signature
Eugenia Quintana EPA (Navajo Land Title Data System - Windowrock AZ)	Air and Toxics - Reviewer	Navajo Nation Environmental Protection Agency	Approved	1. Developer should ensure they maintain a state General Air Permit for the equipment that will generate emissions. No copy of a General Air Permit was noted among the documentation.	1. No Reply	03-Mar-2017	
Lee Anna Martinez EPA (Navajo Land Title Data System - Windowrock AZ)	Water Quality - Reviewer	Navajo Nation Environmental Protection Agency	Approved	1. Please consult with our office regarding your project being so close the San Juan River, it very possible you need a Clean Water Act Section 401 certification. You may contact us at 928-871-7690. Thank you.	1. No Reply	01-Mar-2017	
Pam Kyselka F&W (Navajo Land Title Data System - Windowrock AZ)	Technical Review	Fish and Wildlife	Approved	1. BRCF prepared by jcole. Ref#05/07/09A	1. No Reply	20-Mar-2017	
Pam Maples EPA (Navajo Land Title Data System - Windowrock AZ)	Storage Tanks Program - Reviewer	Navajo Nation Environmental Protection Agency	Approved	no comments	No Reply	28-Feb-2017	
Patrick Antonio EPA (Navajo Land Title Data System - Windowrock AZ)	Water Quality - Supervisor	Navajo Nation Environmental Protection Agency	Approved	1. CONDITIONAL: Must obtain coverage under the federal Multi-Sector General Permit for storm water discharges associated with industrial activities. See linked document.	1. No Reply	27-Feb-2017	

Robert Allan Deputy
DNR Director
(Navajo Land DNR
Title Data
System -
Windowrock
AZ)

DNR
Administration

Approved 1. Conditional:
1. No
Reply
Need consent
of permittees,
if there are
any. Survey
indicates
people may
be living in
area, but
application
lacks any
information
in this regard.
Need to
update Lease
indenture.

22-Mar-2017

Robert O. Allan

Tamara Billie HPD
NNHP Reviewer
(Navajo Land
Title Data
System -
Windowrock
AZ)

Historic
Preservation
Department

Approved 1. Approval is
1. No
Reply
granted
provided that
stipulations in
CRCF HPD-07-
1001 is adhered
to. for Sites
NM-H-20-140,
NM-H-20-141
& NM-H-20-
142: 1. Prior to
ground any
disturbing
activities, the
site boundaries
will be flagged
by a qualified
archaeologist.
2. Sites will be
avoided by
fencing the site
boundaries. 3.
Sites will be
monitored by a
qualified
archaeologist
during fencing
and during all
ground
disturbing
activities
within 50-ft of
the site
boundaries. 4.
A brief
letter/report
documenting
the result of the
monitoring at
the sites will be
submitted to
NNHPD/CRCS
within 30 days
of the
monitoring.

02-Mar-2017


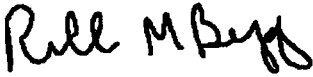
Tamara Billie

Yolanda Public
Barney EPA Water
(Navajo Land System
Title Data Supervision
System - Agency
Windowrock
AZ)

Navajo Nation
Environmental
Protection

Approved no comments No Reply 27-Feb-2017

Yolanda

User Name (Facility)	Job Title	Department	Vote Cast	Comments	Replies	Vote Date	Signature
Bidtah N. Becker (FBFA)	FBFA Users	FBFA Action Team	Approved	1. I am marking this document sufficient and take this opportunity to comment on two comments received from other reviewers. 1. Mr. Allan reported that no consents are included in the packet. In a letter from Raimi Nelson, Grazing Committee Member, dated October 6, 2016, Mr. Nelson notes that there are no affected permittees. This letter is attached to the Land Withdrawal Designation approval letter. 2. Mr. Ronnie Benn rejected the package due to the fact that the 401 Certification had expired. The applicant provided a letter from the Army Corps of Engineer dated November 7, 2017, indicating that no permit is required. That being said, I encourage the applicant to continue working with the Navajo Nation Environmental Agency to ensure that the sand and gravel operations are in compliance with NNEPA regulations. Thank you.	1. No Reply	10-Jan-2018	
Richard Begay NNHP (Navajo Land Historic Title Data System - Windowrock AZ)	Navajo Nation	Historic Preservation Department	Approved	1. Adhere to stipulations specified on NNHPD compliance form dated 11/21/2007	1. No Reply	27-Mar-2017	

Ronnie Ben EPA (Navajo Land Title Data System - Windowrock AZ) Underground Injection Control - Reviewer Navajo Nation Environmental Protection Agency Approved 1. Sufficient vote based on compliance with all NNEPA and USEPA environmental laws. 1. No Reply 25-Jan-2018

Noi he

Sam Diswood (Navajo Land Title Data System - Windowrock AZ) Technical Reviewer Fish and Wildlife Approved no comments No Reply 22-Mar-2017

Samuel T. Diswood

Steven Prince MIN (Navajo Land Title Data System - Windowrock AZ) Technical Reviewer Navajo Nation Minerals Management Approved 1. Please permanently replace the original attachment S with the uploaded "S. Lease and Access Road ROW-revised11072017.pdf". 1. No Reply 04-Dec-2017

Steven L Prince

W. Mike Halona (Navajo Land Title Data System - Windowrock AZ) Manager III NLD Navajo Land Administration Approved no comments No Reply 27-Mar-2017

W. Mike Halona



NAVAJO NATION ENVIRONMENTAL PROTECTION AGENCY
Water Quality/NNPDES Program
P.O. Box 339
Window Rock, Arizona 86515
Phone: (928) 871-7690
FAX: (928) 871-7599

Russell Begaye
PRESIDENT

Jonathan Nez
VICE PRESIDENT

M-E-M-O-R-A-N-D-U-M

TO: NTLDS Reviewers/Approvers

FROM: Patrick Antonio, Principal Hydrologist
Navajo EPA – WQ/NPDES Program

DATE: February 27, 2017

SUBJECT: **Document No. 7629 – LWD/Lease San Juan S&G, LLC**

Dibe Niista, LLC, Sand & Gravel will be a supplier and processor of construction aggregate, asphalt and concrete materials at a location that will disturb 105 acres of land surface in Hogback, NM. Sand and gravel mining would appear to be the primary industrial activity with asphalt and concrete materials as co-located industrial activities. According to the EA for the project, "Consultations has been made with the Navajo Nation EPA Office...Dibe Niista Sand & Gravel will insure that all permitting requirements for Storm Water Pollution Protection are provided and the filing of a notice of intent (NOI) prior to construction."

A construction sand and gravel operation would require coverage under the federal Multi-Sector General Permit (MSGP) for storm water discharges associated with industrial activities. Construction sand and gravel operations fit into Subsector J1 under Sector J for Mineral Mining and Dressing. Sector J would cover storm water discharges from (1) inactive facilities, (2) active and temporarily inactive facilities, (3) earth-disturbing activities conducted prior to active mining activities, and (4) sites undergoing reclamation.

To obtain coverage under the MSGP, a NOI must be submitted 30 days prior to commencing discharge. A storm water pollution prevention plan (SWPPP) must be prepared before to submission of the NOI. This SWPPP should address all the activities associated with sand and gravel mining, as well as the activities associated with asphalt and concrete materials.

For questions, contact me at extension 7185.

RESOURCES AND DEVELOPMENT COMMITTEE
Regular Meeting
April 11, 2018

ROLL CALL
VOTE TALLY SHEET:

Legislation #0119-18: An Action Relating to Resources and Development; Approving a Sand and Gravel Lease to San Juan Sand and Gravel, LLC, to Extract Sand and Gravel from 40 Acres, More or less, of Navajo Nation Trust Lands, and An Access Road of 4.3 Acres, More or Less, of Navajo Nation Trust Lands Located Within the San Juan Chapter Vicinity, Navajo Nation (San Juan County, New Mexico) *Presenter: Honorable LoRenzo C. Bates; Co-Sponsor: Honorable Davis Filfred*

MAIN MOTION: Benjamin Bennett S: Leonard H. Pete V: 4-0-1 (CNV)

ROLL CALL VOTE TALLY:

YEAS: Benjamin Bennett; Davis Filfred; Leonard H. Pete and Walter Phelps

NAYS: NONE

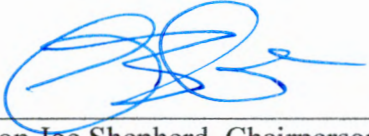
NOT VOTING/EXCUSED: Jonathan Perry and Alton Joe Shepherd (Presiding)

AMENDMENT # 1:

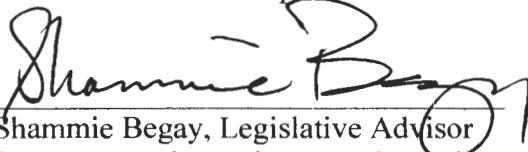
Motion: Benjamin Bennett S: Leonard H. Pete V: 4-0-1 (CNV)

YEAS: Benjamin Bennett; Davis Filfred; Leonard H. Pete and Walter Phelps

NAYS: NONE



Alton Joe Shepherd, Chairperson
Resources and Development Committee



Shammie Begay, Legislative Advisor
Resources and Development Committee