

GRAVEL PIT STUDY UPDATE

Navajo Division of Transportation – Department of Roads



PHASES OF GRAVEL PIT DEVELOPMENT

	Phase 1 Surface Geological Investigation	Phase 2 Sub-Surface Geological Investigation	Phase 3 Contractor/Vendor
Surface and Sub-Surface Sampling	Hand Sampling; Max 8 gallons bucket	Drilling and Testing	Full Environmental Assessment
# of Sites	20 Sites	10 Sites	5 Sites
Permission to Survey Required	Yes: Permission to Sample	Permission to Drill (Minerals Department)	Permission to Survey
Surface Impact	None	Moderate Impact	Major Impact
Permit Required	Survey Permit	Prospecting Permit (Minerals Department)	Mining Permit
Involvement	Notify Grazing Permit Holders and Chapters	Land Department Involvement	Land Department Involvement



TASK ORDER GIVEN TO WILSON AND COMPANY (ON-CALL ENGINEERING)

- Full Assessment and Cursory Exploration of the Navajo Nation five potential gravel pit site.
 - The sites should be strategically in close proximate to the proposed roadway improvement identified in 5-year Tribal Transportation Plan (TTP) and also Road Maintenance and Road Improvement (RMRI) Routes funded by Fuel Excise Tax.
- The goal is to identify the sites, get them permitted for use and allow the contractors proposing on these future projects to utilize them as material source.



PHASE ONE – SURFACE GEOLOGICAL INVESTIGATION

- Sample surface material
- Determine Quality
- Require Geological Investigation Permit from Navajo Minerals Department
- Six Permit Applications were submitted for the following sites:
 - 1. Klagetoh
 - 2. Tolani Lake
 - 3. Greasewood Springs #1
 - 4. Wheatfields / Tsaille
 - 5. Kinlichee
 - 6. Shiprock 4,5,6
- AMEC (Sub-Contractor of Wilson & Company) will complete the Geological Investigation.



PHASE TWO: SUBSURFACE GEOLOGICAL INVESTIGATION

- Sub-Surface Geological Study
- Determine Quantity



PHASE THREE: HIRE CONTRACTOR TO EXTRACT MATERIAL

- Request for Qualification
- Select a Contractor / Vendor
- Contractor will:
 - Prepare Mining Plan
 - Pay for Reclamation Bond
 - Address Royalties



TIMELINES FOR SURFACE AND SUB-SURFACE ASSESSMENTS

	Aug 2015	Sept 2015	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016
Identified top eleven potential Gravel Pit Sites	x	x										
Obtain Chapter Resolutions for Surface Investigation		x	x	x								
Submit Geological Investigation Permit to Minerals Department		x	x									
Geological Investigation Permit Issued to AMEC (Consultant)			x	x								
AMEC to conduct Geological Investigation				x	x	x						
Share Geological Investigation Results						x	x					
Obtain Chapter Resolution for Sub-Surface Investigation							x	x	x			
Submit Sub-Surface Investigation Permit to Minerals Department									x	x		
Share Sub-Surface Investigation Results										x	x	
Select Gravel Pit Site											x	x



TIMELINES TO SELECT COMPANY TO EXTRACT GRAVEL

	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sept 2016
Navajo DOT to issue Request for Qualification to select Company that extract material source (gravel)	x	x										
Select Company and Begin Contract			x	x	x							
Company to submit Mining Plan for Approval										x	x	x
Mining Plan Approved and Begin Extracting Gravel												x



IDENTIFIED NINE POTENTIAL GRAVEL PIT SITES

First Top Five Sites

- 1. Klagetoh Site
- 2. Tolani Lake Site
- 3. Greasewood Springs #1
- 4. Wheatfields/Tsaile Site
- 5. Kinlichee Site
- 6. Shiprock Area 4, 5, and 6

Second Top Five Sites

- 6. Shiprock – Cudeii #3
- 7. Owl Canyon #1 Site
- 9. Rincon Ranch Site



CHAPTER RESOLUTIONS NEEDED

Sites	Chapter Resolution Status
Klagetoh Site	Pending
Tolani Lake Site	Received
Shiprock – Cudeii Site #3	Pending
Greasewood Site #1	Received
Wheatfield / Tsaile	Pending
Owl Canyon	Pending



CRITERIA USED TO PRIORITIZE SITES

No.	Parameter	Criteria	Rating 0	Rating 5	Rating 10	Rating 15	Rating 20
1.	Uranium Impacted	Distance from overall radioactivity source and excess Bismuth	< 1 mi		> 1 mi.		
2.	Fish & Wildlife Designation	Biological Preserves & Recreation Areas	Yes				
		High-Sensitive Areas		Yes			
		Medium-Sensitive Areas			Yes		
		Community Development				Yes	
		Low-Sensitive Areas					Yes

CRITERIA USED TO PRIORITIZE SITES

No	Parameter	Criteria	Rating 0	Rating 5	Rating 10	Rating 15	Rating 20
3.	Parks and Recreation	Distance from site	Within boundary	<1 mi	> 1 mi		
4.	Archaeological Impacts	Archaeological Survey Results	< .5 mi	0.5 - 1 mi	> 1 mi		
		Traditional Cultural Properties	< .5 mi	0.5 - 1 mi	> 1 mi		
5.	Proximity to Proposed Projects	Distance to proposed site	.40 mi	< 20 mi & near 1 project	20 - 40 mi	0 - 20 mi.	

CRITERIA USED TO PRIORITIZE SITES

No.	Parameter	Criteria	Rating 0	Rating 5	Rating 10	Rating 15	Rating 20
6	Chapter & Community Support		No		Yes		
7	Legal Description Complete	Legal Description Complete	No		Yes		
8	Access Road	Distance from paved road	> 5 mi	1 - 5 mi.	0 - 1 mi		
		Hauling route impacts	> 10 homes	5 - 10 homes	0 - 5 homes		
		Haul road condition	Unimproved	Improved	Gravel		

CRITERIA USED TO PRIORITIZED SITES

No.	Parameter	Criteria	Rating 0	Rating 5	Rating 10
9	Surface Environmental Site Conditions	Illegal dumping at site	Yes		No
		Drainage impediments	Yes		No
		Proximity to public development	0 - 1 mi		> 5 mi
10.	Proximity to Water Source	Nearby well location	>5 mi.	1-5 mi.	0-1 mi.
		Well access usage	No		Yes
11.	Project Specific Requirements	Estimate volume for TTTP and FET Projects	<5 mi.	5-10 m.	>10 mi
12.	Proximity to Water Source	Nearby well location	>5 mi.	1-5 mi.	0-1 mi.

CRITERIA USED TO PRIORITIZE SITES

No.	Parameter	Criteria	Rating 0	Rating 5	Rating 10
13.	Material Quantity Desktop Estimate (Not Yet Determine)	Estimated Quantity to supply X miles of road	1 mi	5 mi	10 mi



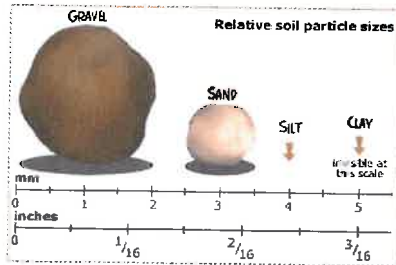
CRITERIA USED TO PRIORITIZE SITES

No.	Parameter	Criteria	Rating 0	Rating 5	Rating 10
14.	Material Classification Desktop Estimates (Not Yet Determine)	Sand and Gravel Deposit	No		Yes
		Surfacing specification material is compliant to BIA Specification.	No		Yes
		Rock Quality Designation	No		Yes
15.	Factors associated with extraction	Screening	No		Yes
		Crushing	No	Yes	
		Supplementing	Yes		No
		Heavy Equipment extraction methods (i.e. blasting, ripper, excavator.	0	5	10



TARGET GRADATION FOR GOOD GRAVEL MATERIAL

FRACTURED FACES OF THE AGGREGATE IS IMPORTANT AS IT PROVIDES BETTER INTERLOCK OF THE MATERIAL
Mixture of Sizes of Gravel is Important



Gradation Targets

Required Sieve	Gravel Material % Passing
1 inch	100%
3/4 inc	50 – 78%
1/2 inch	37 – 67 %
#4	13 – 35%
#8	4 – 15 %
#40	4 – 12 %
#200	
PI	



NEED SUPPORT

- Chapters
- Grazing Permit Holders
- Navajo Division of Natural Resources Departments
- Resources and Development Committee



CONTACT INFORMATION

- Darryl Bradley, Acting Division Director
- Ray Russell, Department Manager/Department of Roads
 - (505) 371-8300
- Marlinda Littleman, Senior Programs & Projects Specialist/Department of Roads
 - mlittleman@navajodot.org
- Angelina Barber, Programs & Projects Specialist/Department of Roads
 - (505) 371-8362
 - abarber@navajodot.org
- Scott Perkins, Vice-President, Wilson & Company (Consultant)
- Natanya Garnenez, Engineer, AMEC Foster Wheeler (Sub-Consultant)

