Farmington District Resource Advisory Council Meeting

May 28-29, 2014—Taos, New Mexico

Minutes

May 28, 2014 Attendees:

RAC Members (Category):	BLM Staff:	Visitors:
Anthony Benson (3)	Dave Evans, FDM	Martha Brown
Barbara Kiipper (2)	Sam DesGeorges, TFO	
Michael Lane (1)	Gary Torres, FFO	
Kathy McKim (3)	Maureen Joe, FFO	
Norman Norvelle (3)	Christine Horton, FFO	
Evert Oldham (2)	John Bailey, TFO (PM)	
Jerry Sims (2)	Brad Higdon, TFO (PM)	
Nickie Vigil (3)	Allison Sandoval, NMSO	
	Leslie-lynne Sinkey, FFO	

RAC Chair Kathy McKim called the meeting to order at 9:01 am.

RAC members, BLM personnel and visitors introduced themselves.

Minutes of the last meeting: It was noted that these were approved via email within the 30-day window specified by regulation. As this must occur for any given RAC meeting long before the next meeting is convened, it was agreed to strike this item from the agenda for future meetings, being redundant.

Christine Horton noted that a quorum was not present, as there were an insufficient number of members of Category 1, and that therefore no official actions could be taken. As none had been planned for the agenda, this did not present a difficulty.

Kathy McKim asked for approval of the agenda as presented. Agenda was approved.

Dave Evans—Welcome and General Update:

As the RAC members may be aware, this will be his last RAC meeting, as he will retire on Friday. Gary Torres will take over as the Acting District Manager until a new candidate is selected. It has been 37 years of fun, but also humbling and an honor—the BLM has taken him from Africa to the Arctic Circle. How does someone from Winthrop, WA wind up working on the Serengeti? But with the BLM, you can.

The job announcement for his position is on the street, and the selection should occur within 45-60 days. Many of the RAC members are aware that they are heavily involved in the Mancos liquids play, but he will defer to Gary to address that.

Gary Torres: As the RAC members are aware, the explanations of the BLM's activities are usually split into those dealing with non-renewable resources, and those dealing with renewable resources. Maureen will walk us through some of their activities, and then they'll present a PowerPoint on the Mancos project.

Maureen Joe—Update on Lands and Renewable Resources Activities:

There are currently three major projects ongoing. The first is the San Juan Energy Connect Project, which is a transmission line over 64 miles long. Public meetings for this project were recently held in Farmington and Ignacio, and the public comment period ended on May 20th. The Southern Ute Tribe would like to have another route considered, and they are currently in consultations with them in this regard.

Gary indicated that the BLM had thought that they were in agreement with the tribe, as they had met many times with their staff, but the Tribal Council felt that they were out of the loop. They had concerns about their preferred route, and the BLM will analyze it in detail. The BLM has asked them to provide the details of the Council's preferred route—they have several options under consideration. The BLM's preferred route avoided the Rattlesnake Wildlife SDA. The route reconsideration will delay the project by about six months, as they will have to do a supplement to the EIS. Tri-State still believes that the project is worthwhile. It would provide a power line from Shiprock to Ignacio, and provide the Southern Ute Tribe with greater power reliability and potential for growth. Tri-State has spent about $6 million already—they did everything by the book. The last ten miles of the power line would be on Southern Ute land. If the Southern Ute Tribe do not approve a route, the project cannot go ahead.

Kathy asked, if they did not go through the Rattlesnake SDA, which way would they go? Through Hart Canyon and the Arkansas Loop? Gary said yes, that it would cross the highway right where you go into Colorado. The Southern Ute Council would prefer to put it across the Rattlesnake SDA. Gary said that he would provide a copy of the map to all RAC members [see Fig. 1]. The Southern Utes feel that their concerns have been heard, and the original comment period was extended at their request. They feel that they still have a good relationship with the Southern Ute Tribe.

Dave remarked that there is an interesting component to the project—it provides the Southern Ute with the possibility to develop a "co-gen" natural gas/renewable energy plant, and would allow them to sell that power on to other markets, such as in California. Gary observed that it was just a power delivery system, so there are clean energy implications there. Tony Benson asked how many years the project had already taken, and Gary replied that it had taken six years. The entire project was expected to cost $115 million. Myke asked Gary if there were any "lessons learned," to make such large-scale projects more expedite or make them efficient in the future.

Gary replied that they had learned not to be "overly innovative," and not to show folks what they weren't accustomed to see. In this case, the BLM worked closely with the ID team, and thought that even the public bought in on the final alternative that was presented, based on the feedback from the public meetings. The EIS contained a no action alternative and a preferred alternative.

They designed the project as they went, and had thousands of pages of supporting information—they did it right. They also had a willing proponent to work with, who was willing to include a lot of mitigation and design features.

They sent it to Washington, DC, and were told that they could not have an EIS with just one alternative (plus the no action alternative). Gary told them to demonstrate where in the handbook it indicated that they could not have one proposed alternative—it doesn't indicate that anywhere—but DC would not accept that. They felt it was very well thought-out, and the EPA wrote a letter of support for the EIS as it was written—the first time Gary had seen that. So they had some folks saying that they did it just right, and others who thought it wasn't a good way to go. Next time he'll include at least one other alternative. Myke recapped by saying that part of the marketing for a project is to make it familiar.

Dave said that they also learned that outreach to tribes needs to be with the council, and the BLM had been working closely with the staff. Maureen observed that the Hopi Nation have indicated that if it has a direct effect on the tribe, it should go through the council, and if the effect is indirect, then it can be handled by the specialists. That makes a good rule of thumb. Gary remarked that they thought that the council was on board, so they felt that they had been blindsided. In the future, they will ensure that BLM representatives ensure that they are on the Council meeting agendas, so they can discuss it with them directly.

Kathy asked what constituted a direct vs. an indirect effect in the case of the Southern Ute. Maureen said that if the project is off the reservation, it is an indirect effect. Evert noted that many tribes have extra-territorial jurisdictions and concerns. Myke noted that many of the tribes consulted for the Monument were not directly affected, so would the BLM then be collaborating with specialists rather than the Council?

Dave said that government-to-government consultations also took place. Sam and his staff went over to Hopi to consult with them regarding some of the Traditional Cultural Properties—tribal interests can extend far beyond what we think of as their geographic area. On the Mancos-Gallup EIS, all of the Pueblos have expressed interest. Dave said that the Counsel of the Governors of the Pueblos simply felt that they wanted to be consulted. Gary noted that other tribes will often give deference to the decision of the tribes whose land it is, and if it is on tribal land, that the BLM needs to be sure that it goes before the Council.

[Maps to of the proposed routes were distributed.]

Gary indicated that the route 28-30-32-37 had been the preferred route. The blue line on the map was the Southern Ute preferred route, through Rattlesnake SDA. The southern crossing of the Animas River is very problematic—it requires eight to ten structures down in the riparian zone, and cause all kinds of trouble, whereas the northern crossing could be done pole-to-pole, and nothing was in the riparian area. It was a significant engineering project, but would eliminate so many other problems. Where the blue line crosses into Colorado on the map, up to number 43 on the map, and then along 45 and on to Ignacio was the tribe's original preference, as conveyed to the BLM. They weren't greatly concerned about how it gets to Southern Ute

land, as long as it follows their preferred route within it. Now they may select 44, 46, or 48. They will be holding a meeting today to discuss it internally.

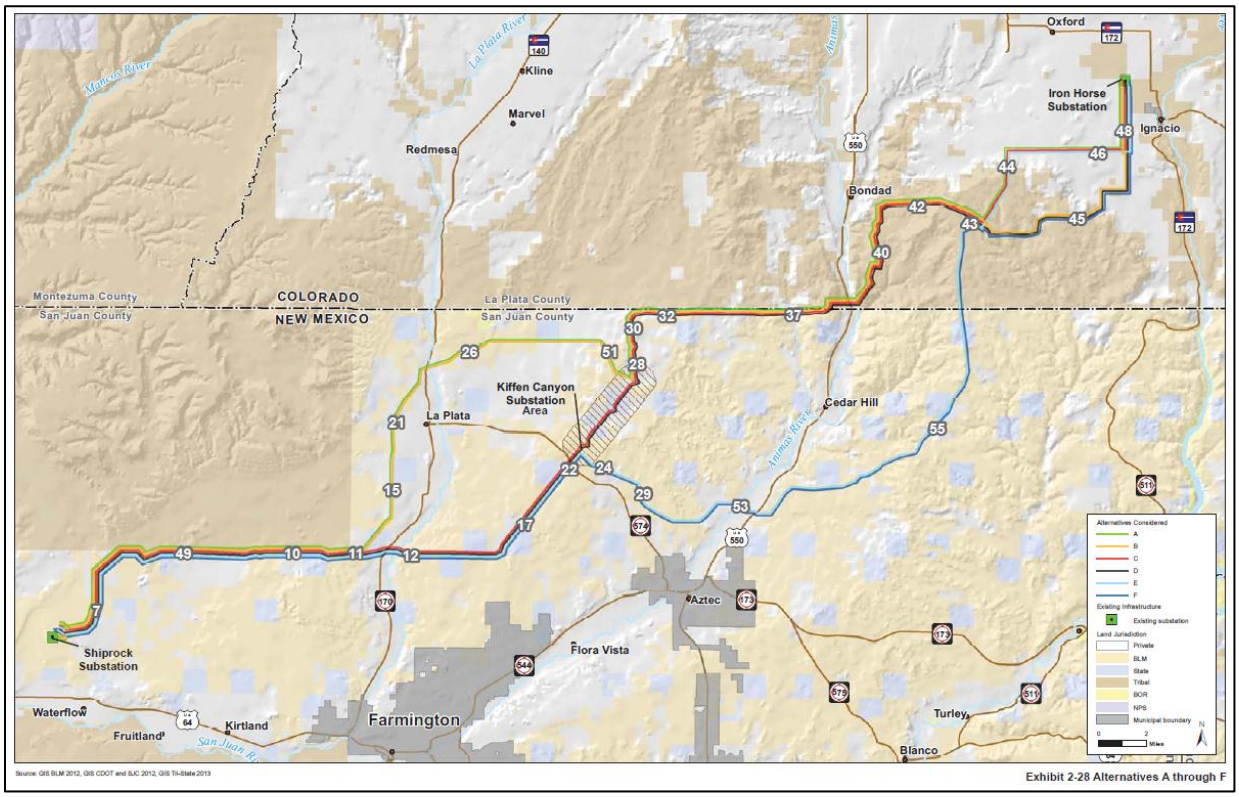

Figure 1: San Juan Energy Connect Alternative Routes

Maureen continued the briefing on current Lands and Renewable Resources projects by noting that the original Glade Run Recreation Area comment period had closed. and an additional 15-day comment period closed February 20th. Janelle Alleman is currently going through the additional comments. Gary noted that the BLM had also hired a NEPA expert to review the document and the comments and to give input regarding how well the BLM had done in resolving the issues raised. He provided some good input. The goal is to produce a document that will be defensible, even if it isn't palatable to certain groups. Myke asked how many comments had been received during the additional comment period, and Gary estimated that it was less than one hundred.

Dave noted that one issue that has been problematic the Field Office had been hit with so many Freedom of Information Act (FOIA) requests lately that it has consumed considerable staff time. One FOIA may have to go to litigation, because the request is *so* broad—the BLM has already submitted 14,000 documents. They have estimated that it would take two staff almost a year just to accumulate all the information. The BLM has requested to meet with their counsel to resolve this.

Gary noted that there is no administrative relief from a FOIA—they can't be postponed. The El Segundo FOIA was 40,000 pages, for the Glade they are up to about 14,000 pages. All of the time that is spent fulfilling the FOIA is unfunded work, and comes from staff time spent doing

other things. There aren't special people assigned to FOIAs, they have to pull staff off of what they are doing so they can go make copies for months on end. He understands the need for transparency, but some groups may use FOIAs as a mechanism when decisions are issued against them. They may lose in court, but they can still slow the process of implementation of the decision by tying up the staff on FOIAs. Dave noted that many of the BLM staff are "one up," (there is only one person doing that type of work) so the same person who is trying to get the final document out is the same one that is trying to process the FOIA. The numerous FOIAs slow staff down, and make the BLM appear inefficient in the public's eyes. The general public doesn't know this is going on. We say we'll be ready by May, but then we can't, because of a FOIA.

Tony asked if FOIA requestors could be charged, for instance a dollar a page. Dave replied that many of the groups are non-profits, and under the equal access to justice requirements, cannot be charged for the FOIA. That's one reason that the Glade has been delayed—they have one Recreation person, and she has spent countless hours making thousands of pages of copies.

Related to Recreation, Gary moved on to address some recent use of drones for filming outside the Bisti/De-Na-Zin Wilderness, and showed a few slides of the drone used. They were used to fly around and near the hoodoo formations. The BLM's paleontologist and Recreation Specialist went out to monitor them. Dave noted that the drones cannot land in the Wilderness, so they cannot stage in the Wilderness. Gary remarked that the BLM has never controlled the airspace over the Wilderness.

Evert Oldham remarked that the Federal Aviation Administration is currently working to address the issue of drones by the end of 2015. He then returned to the issue of FOIAs, and expressed that in the interest of the spirit of FOIAs, that transparency should be on both sides—that the public should also be informed who is making the FOIA requests, in view of the resource demands. Social accountability governs society as a whole. Myke asked if the BLM could disclose who has FOIAed, and by whom, the level of resource demands, etc., and Gary responded that they could. Dave noted that FOIAs are for public information—private citizens should be able to go to the group that issued the FOIA, and obtain the information from that group. Myke suggested that the BLM put the information on their website—what FOIAs are pending, who requested them, when the request was received, status, etc. He also asked if FOIAs could be done electronically.

Dave replied that all FOIA documents are provided in electronic format, but that all of the documents have to be scanned. Then the FOIA goes to the State Office, so that any proprietary information can be redacted. Then the FOIA goes to the Solicitor's Office. He did not know if the information regarding FOIAs could be posted until they were complete, but it should be possible to post them once they were closed. Also, the BLM also has an open policy—folks can come and look at the open files, if they just come to the office.

Norman Norvelle noted that when Congress approved the Freedom of Information Act, they had no idea how it would be used—or abused. Dave agreed that deadlines and high-importance projects have to be put on hold. When the last Resource Management Plan was done back in 2003, the office was not as digital, and so they have to scan all the information from the last

eleven years. Gary noted that the BLM doesn't deal with "top secret" information. , The Interior Board of Land Appeals only recently started to accept electronic documents, so even if they had electronic copies, they had to make hard copies.

Maureen addressed the third major project being undertaken by the Lands and Renewable Resources team—the Navajo Gallup Water Project. This is the water system will service eastern New Mexico. The Bureau of Reclamation is the lead agency, and most of the BLM's involvement is with the Cutter Lateral (there are two laterals, the Cutter and the San Juan), which runs from Cutter to Huerfano Mesa, and is referred to as "Reach 22." It is approximately 24 miles long. The BLM is reviewing the EA, which the BOR expects to construct this reach in 2015-17. The entire project is expected to be complete in 2024.

Gary observed that this was a billion dollar project, and in some places they are installing a 40" diameter water line. The BOR originally forgot to include the BLM as a cooperating agency when they did the EIS for the project, so the BLM is doing EAs to adopt the EIS done by the BOR. Dave noted that it will draw 35,000 acre feet out of the San Juan to go to the Eastern Agency. It will leave no water rights unallocated in the San Juan.

<u>Gary Torres—Mancos Shale Resource Management Plan Amendment</u>

The FFO is currently working on the Mancos Shale Resource Management Plant Amendment (RMPA) and the associated EIS. Most of the project has now been funded (approximately $3 million) and they expect the EIS to take about three more years. The last Reasonable Foreseeable Development (RFD) was done in 2002. New Mexico Tech will be doing the new RFD for the Mancos Shale, mostly in the southern part of the field office, which is where the oil play is. The northern part of the field office already has a lot of gas wells, a lot of infrastructure. South of Highway 550, more roads will be needed, and more pipelines. The 2002 RFD anticipated 9700 wells, only about 4500 have been drilled. The 2003 Resource Management Plan decisions were generally good, but they want to revisit them based on the new information and contemporize the analysis. The RFD analysis area takes in far more than just the FFO—it includes Forest Service, State, Jicarilla Nation, BIA lands, etc. However, the decision space is limited to FFO lands.

Planning issues include:

-How do manage and care for other resources whilst allowing for increased mineral development?

-Management of the increased number of Rights of Way—should specific corridors be developed, and whether there are BLM lands in the area that are appropriate for disposal

-Vegetation Management—Millions of dollars have already been expended on the Restore New Mexico initiative in this area, and treated tens of thousands of acres. Vegetation management also includes issues related to wildlife habitat, special status species, and the maintenance or restoration of healthy landscapes in the area

-Lands with Wilderness characteristics: this is a new requirement for inclusion in all planning. It involves a travel inventory, to determine if there are any "untrammeled" areas of 5,000 acres or more. There is currently a contractor doing an inventory of all of the roads. It is likely that there are some that are 5,000 acres or more, but it is unknown how many there might be.

Mineral development involves determining the allocations--if there are lands that are open for development, closed to development, or open with restrictions.

Tony observed that at the New Mexico Geological Society meeting that they were informed that horizontal fracturing requires c. three times the amount of water that is needed for vertical fracturing. Water sources for fracturing become part of the mineral development issues. Gary replied that there is currently a hydrologic study that is being done. This is one of the reasons that nitrogen fracturing was being used—it reduces the water needs by 70%. Industry is also beginning to use produced water for fracking. Myke noted that WPX had used 100% produced water for past developments, but that there simply isn't enough produced water resulting from work in this area. He also pointed out that although the horizontal fracking required three times the water of vertical fracking, but that they are also able to replace ten vertical wells with one horizontal well. Nitrogen fracking presents other issues.

Dave said that this was difficult to explain to the public—the nitrogen reduces the available BTUs in the gas and renders it unmarketable. Myke agreed that there had been a lot of nitrogen injected into the formation—they can't sell that gas, it can't even be used to run the compressors, because the BTUs are so low. Right now they are flaring off that unusable gas. Industry is looking at using a nitrogen sieve, but the problem is with the larger volatile organic molecules, and they don't know whether the sieves can be made to work. Once the nitrogen is out, then the gas will be marketable. The other problem that industry is encountering is the Rights-of-Way approval process—it needs to be cleaner, which is why the EIS is important.

Gary observed that the public sees them flaring the gas, and that the houses nearby have no heat. It takes 60-90 days of flaring to clear out the nitrogen. Then the problem with ROWs—one way that they are trying to address that is by allowing surface pipelines, until they are able to get the infrastructure in place.

Myke noted that industry doesn't like the flaring either—it's the waste of a resource. Dave said that they are also looking at re-injecting that gas back into the formation. Norman inquired whether the flares could be enclosed. Myke said that elsewhere industry had tried enclosed flares, but they don't get as complete combustion. The EPA requirements are that they attain 95-98% destruction, but although the enclosed flare hides the flame, it takes more retention time to get complete combustion. The EPA has approved "candlestick" flares outright, but has only certified one enclosed flare manufacturer as meeting their combustion standards. They also have safety issues—with a candlestick, you can see if the flame has gone out.

Gary returned to the issue of issues with the Mancos Shale development. They are considering whether there are corridors where rights-of-way should be prohibited or restricted, etc. The FFO is the first- or second-ranked office in the entire BLM for the number of rights-of-way they

process—about 16,000, and that doesn't even include the area south of Highway 550 where they will need to start issuing more ROWs. There are also some places where they would like to do some land exchanges, and this document would allow them to do that.

There are some studies going on to address vegetation management—they'll be doing some Rapid Ecological Assessments. The latest "blip" is the Brack's cactus—it is a state-listed species that has been found in the southern part of the field office on the Nacimiento formation. They are proving much more numerous than previously thought. Should they even be listed? This will have to be addressed in the EIS—they don't want to over-protect something they don't need to, but don't want to be negligent, either. They have identified some funding sources for interns to do an inventory…there are places where it seems that you can't swing a dead cat without hitting a Brack's cactus. They will be doing 375,000 acres of vegetation community studies.

The planning criteria for the project requires that they recognize valid existing rights, and to be more cooperative and collaboratively in the planning process. The 90-day scoping period closes today, and they will then write the scoping report summarizing the results. The scoping period was much longer than that required by law, in order to try to get greater involvement. Gary and Dave have gone out to the chapters and the tribes and the county to push the scoping. After that, they will start developing alternatives later this summer.

Myke asked if this was a similar process to what is being done for the Rio Grande del Norte Monument plan. Gary said yes, and that the scoping issues are those that they will try to address in the EIS, and observed that the planning document was really several documents—the RFD, the hydrologic studies, the air quality studies, the vegetation studies, the travel inventory, and the determination of lands with wilderness characteristics. Each of these will be major reports that will be incorporated by reference into the larger EIS. They set the stage for the analysis. The BLM has sent letters to 59 other agencies and tribes to invite them to be cooperating agencies, and then Memoranda of Agreement will be created with those that are interested.

Gary noted that in 1998, the San Juan Basin generated 1 trillion cubic feet of gas, and now it is about 750 billion. Dave observed that this was due to under-pressurization of the reservoir, and that—due to the low price of gas—industry hasn't been drilling new wells. Once the price of gas comes up, they expect matters to pick back up. Myke asked whether, although the Mancos RFD study was being driven by oil, gas was also being considered. Dave replied that it was—most of the oil thus far had been found in the Gallup, but it was looking at both formations. Gary noted that the FFO contributed half a billion dollars in royalties from oil, gas and coal to the federal coffers. This is an oil and gas office, and we have 30 petroleum engineering technicians. Myke commented that price drives most of the change in royalties, and Dave agreed, saying that the royalties were 12.5% of the sale price.

Gary said that the national hydraulic fracturing rule re-write has received 1.35 million comments. They are planning a field office review in the next few days, the Office of Management and Budget will review it, and the rule is supposed to be finalized by the end of the year. The other rules and off-shore orders that had been proposed have been shelved for a while, and the focus

is on the hydraulic fracturing. Dave said that it was unknown how many of the comments were substantive—yesterday they received a petition with about 8,000 signatures to limit the amount of fracking activity around Chaco. It's all the same comment, but with 8,000 signatures. Dave joked that he had acquired 6000 new pen-pals in two days. Groups involved had a link on their websites that automatically sends a form letter with the identical comment and their name. They try to swamp your mail system.

Barbara Kiipper asked whether, if five hundred people sign one comment, it is considered five hundred comments, or one. Gary said that it only had to be addressed once in the NEPA document, if it is the same comment. The concept of "voting" doesn't function in the NEPA arena. Earthworks has produced a four-minute video with a lot of erroneous information that attempts to block fracking in the Chaco area. They are trying to get a million people to forward their comments to Sally Jewell, and are up to about 125,000 people worldwide who have opposed fracking in Chaco (they have never proposed fracking in Chaco). Dave noted that although the comment only has to be addressed once in the NEPA document, they have to count each of the comments, even if they are identical. Gary clarified that there are two different times that they take comments. He explained that in the scoping process, they don't have to address each comment—they are just trying to find out what people have concerns about, and then agglomerate them into issues to be addressed. In the draft EIS they are required by law to track each individual by name, even if the comment is identical. An individual has to be able to say, "Show me where you addressed my comment," and they can point to the database. So, some groups purposely flood the system. Right now, Mancos is in the scoping stage. Dave observed that one of the large-ticket items for EIS contracts is for tracking comments for the administrative record.

Tony asked what the major focus of the frack rule is—was it the chemicals used? Is it disclosure, or limiting certain components? Dave responded that a lot of it concerned how they would report what chemicals were used, other protections, etc.

Dave explained that on BLM wells, the Petroleum Engineers set the engineering control standards for water protection, etc., and then the PETs are on site when the well is drilled, to ensure that it is done according to the specifications. The State may not have the manpower to do that on all wells, but the BLM does require it on all wells. In New Mexico, fresh-water aquifers are protected to 2500 feet.

Another related development is the approval to allow the BLM to pay Petroleum Engineers and Petroleum Engineering Technicians a 10-20% pay differential, because industry is hiring them away as quickly as they can be trained. That allows the BLM to hold on to some of its seasoned individuals.

Sam DesGeorges commented that in the realm of Solid Minerals, the FFO was providing support to the Taos office. The Taos office is still dealing with the Surface aspects, NEPA, etc. They are still discussing whether decisions will be issued under the Taos Field Office or the Farmington District Office signature. With mining claims, they have a 15-day period to respond to notices. Some mining claims under 5 acres in size were grandfathered, as they were

considered to be more “recreational mining.” Discussions are ongoing as to how these small claims will be handled.

Gary explained that in situations like with Peabody Coal, where the mine (private minerals and private surface) was adjacent to split estate lands (private surface, federal minerals) the coal mine had the potential to bring $20-24 million into federal coffers. The BLM decided to move forward with the lease. WildEarth Guardians withdrew their IBLA appeal of the case, but they may still sue the BLM in federal court—although it may be a moot point by then, because the coal may have already been mined. The BLM came to their decision because they felt that this was a resource that might otherwise be lost. This was a very small lease, adjacent to the active mine, they already owned the surface, and if the coal had to be developed independently, it would not happen. Dave observed that the mine has an extant rail link to five different power plants, and the decision to go ahead did not change the amount of coal shipped from this mine, it just extended the life of the mine for a few years. Gary noted that some groups wanted an EIS that would analyze the effects of coal mining and power generation over the entire western US. He felt that this small amount of coal was not going to make or break this mining operation.

The BLM in New Mexico has to issue leases every quarter, but the state has arranged so that an individual field office only has to have a lease sale once per year, simply to address the issue of staff time (or lack thereof) for preparing for these sales. FFO will be doing them annually in October. They are also working with the Federal Indian Minerals Office on permitting on Indian allotted lands. Industry has spent $80-90 million to purchase leases on Indian Allotted Lands over the last 90-120 days in that area. FIMO and BIA does not have the personnel to handle the permitting, so the BLM has been helping out on a cost-recovery basis. The details have not all been worked out. They did the first on-sites last week. Dave said that in the next twelve to eighteen months, industry is tentatively going to propose four- to six hundred Applications for Permit to Drill for this area, which means about $500-600 million in capital expenditures the next 12-18 months. That will be important to the regional economy. Gary informed the RAC that the FFO also has four PETs in Carlsbad for the next 16 weeks—the FFO had completed their highest priority wells, and Carlsbad was at 10-20% of theirs. In the Solid Minerals realm, they have been closing old mines on federal lands, and are working on going over past-due royalties and fees for Solids in Taos.

Sam explained that this involved areas such as the Cerillos Hills near Santa Fe. This is a high recreation-use area, adjacent to county lands. They are working with the state to close abandoned mines—many of these are open-shafts, etc. Some of these mines are important bat habitat, and they are looking at what kinds of closures they can use. Another instance is Colorado Lava—the TFO has three large cinder mines, all held by Colorado Lava. They sell the cinder used on flat roofs in the east, and it is also used for snow removal. The suitable cinder is very light—the pumice is profitable to mine as long as it is light, due to the cost of shipping it out east. When they get to heavier pumice, the margin of profit drops, and may even go negative. The BLM requires that they pay for the contract, whether or not the material is mined, so it becomes interestingly complex.

The Santa Fe Caja del Rios landfill is on split estate—private surface, federal minerals. As they were excavating for the landfill, they started to crush the basalt to sell. This has resulted in royalties being due—for the sale of the crushed basalt—of about $500,000. Gary noted that this is an odd situation—split estates are nuanced. It's rather like digging a basement—there's no charge, but if you start selling the dirt, then royalties are due. Sam said that they are willing to work with Santa Fe County—the basalt makes great railroad ballast. Myke asked that the since the federal government is benefiting from the crushing activities, whether that also makes the federal government liable for health issues. Sam replied that it does not, as the State is responsible for managing health and safety regulations.

The last two saleable minerals issues that Taos is dealing with are the San Pedro Mine, a huge abandoned sand, gravel and limestone mine, and the San Lazarus. There are a number of lode and placer mines, some of which pre-date 1955. In the case of pre-'55 mines, the waste belongs to the mining claimant, whereas after 1955, the waste belongs to the federal government, and therefore royalties are due for sales from the spoil piles. It will be necessary to go in and survey all of the post-'55 placer mines, to determine how much has been sold and how much is owed in royalties.

BREAK (10:40-11:00)

Reconvened for a work session on the wild horse and burro issue. Kathy asked Evert for an update on the meeting that he and Jerry and Barbara had with the College.

Evert gave Norman the credit for being the catalyst for the idea at the last RAC meeting. He had put forth the idea of using drones as a management tool for wild horses and burros. Evert spoke with Ray Hagerman at San Juan College, who arranged a meeting with Bruce Black (USAF-Ret.) who is working on developing a drone application for pipeline safety monitoring.

One thing led to another, and he spoke with Dean Bolstad (Senior Policy Advisor for Wild Horses and Burros) regarding the drone idea. The previous day, the BLM had released a request for grant applications for $1 million in funding per year over the next five years. They reviewed the application request—the BLM was primarily looking for longer-lasting birth control or implants, but that pre-supposes that the animals had already been acquired for the procedures, and it omitted the logistics of the actual gathering.

They have considered three platforms for the use of drones for WH&B management. The first is for data acquisition—the actual counting of animals. The second is the use of drones for herding the animals using various stimuli—acoustic, visual and aroma--in changing intensities, so that the animals could be moved without stampeding them and the resulting injuries. The third platform was to use the drones to project darts to inoculate the animals with PZP, radio telemetry devices, tranquilizers for field procedures, etc.

Evert and Dean read over the grant request, and felt that their proposal fell within the parameters. They approached San Juan College regarding the idea, and they have applied (today was the deadline for submission). San Juan College embraced the proposal in part due to its potential for conflict resolution with the WH&B community.

They have assembled a literally nation-wide team. Jay Kirkpatrick, the inventor of PZP, is a consultant. Tony DeNicola, with Wild Buffalo, Inc., is a known ecologist has worked worldwide on problem wildlife issues. He has become so intrigued by the project that he bought his own drone, and is doing experimental flights. Blair Soars is the President and CEO of Pneu-Dart, a leading dart manufacturer, will be an advisor. They reached out to the Society for Rangeland Management and the National Wild Horse and Burro Rangeland Management Coalition. The Rangeland Management Society is a group of academicians and practioners that has been around since the 1920s, providing expertise in rangeland management. They also networked with the Jicarilla Department of Game and Fish, the Navajo Nation Department of Agriculture, the BIA and the Navajo Eastern Agency. The BIA and Navajo Nation Department of Agriculture are doing the roundups of feral horses on the Navajo Nation, and—presuming their proposal is accepted—they will be performing research with these feral horse populations. This will provide a close corollary to the conditions with wild horses.

The USGS has been using drones for many years, including in working with the BLM. Fort Collins USGS science center has been working on using drones for data acquisition with wild horses. The USGS in Denver has the National Unmanned Aircraft Systems Project Office, which works with all federal agencies wanting to use drone applications. Therefore, no research and development would be necessary for data acquisition—drones have been used for that purpose with sage grouse in Colorado, sandhill cranes, and elk in dense forests in Washington State.

Unfortunately, the US has been held back in the development of drone technologies due to a lack of FAA policies, but that should be resolved by the end of 2015. In Germany, 100,000 fawns were being killed due to hay harvesting. They now use pattern recognition and infrared sensors to locate the fawns, and they go out and collar them and they can then remove them to safety prior to harvest. Casualties have been reduced to almost nil. In Africa, drones have been used to patrol against ivory and rhino horn poachers. They have also been used to disperse chile pepper spray to divert elephants from areas of human habitation. (Myke posed the inevitable question: “Red or green?” Evert promised to find out.)

Evert said that the Australians were using drones in brumby management. So, drones have known use in similar applications. There are still two unknowns, the first being animal behavior—can horses be herded with drones? They believe the answer is yes, because they effectively herd horses with helicopters. In Japan, 20,000 unmanned helicopters are being used to spray the crops of small farms, where full-sized helicopters would not be feasible, or prohibitively expensive. The other unknown is whether a projection system can be developed to reliably dart animals from the air.

The project is anticipated to take two years, with an anticipated total budget of $700,000. They have an aggressive program to bring in outside expertise. They plan extensive research and

development to address the two unknowns listed above, and to develop a protocol to deliver to BLM to develop all three platforms. These would be command and control for data-gathering over very large areas that could be operated remotely—perhaps even in a different state, such as New Mexico; 2) people from the USAF and GIS survey who are experienced, and the college wants to develop a curriculum to train operators if the techniques can be successfully implemented.

Myke inquired who the principals were. Evert responded that they are Dr. Barb Ake, Vice President for Learning, who has 20 years in the medical field and is familiar with scientific rigor and who will act as principal investigator; Don Hyder and Veronica Evans, biologists; three veterinarians will ensure animal welfare; and many collaborators and consultants. San Juan College is interested in part because of the intersection of media interest (in WH&B issues) and the use of emerging technology, and also because of the ability to resolve controversy. When Evert spoke the manager of the USGS office in Denver he said that in his career he has never seen the level of excitement that there is over drones. He also said that he had never seen such a magnitude of opportunities to develop new technologies and best practices, in 29 years of wildlife management.

Norman remarked that the Farmington area is ideal for developing this kind of technology, due to the terrain, the small herds, the mesas, etc. Evert agreed that there is great support from the community. They have been very busy with the grant application, but they expect a lot of interest from industry, as well. It has been interesting working with the WH&B community. They can sometimes seem prone to radicalism, but that is because they feel that their ideas have repeatedly been turned away. Jerry Sims asked if he felt that this would bring them together. Evert hoped so, but whenever one is dealing with communities that have become radicalized through disenfranchisement, it takes time to rebuild that trust. The College is adamant that they are interested in this as a means of conflict resolution. Jerry said that he had gone to one of the meetings, and that there were three horse advocate groups represented, and asked if other groups had come on board. Barbara responded that National Mustang of Association of Colorado was on board, and the Mesa Verde Back Country Horsemen. Evert remarked that TJ Holmes was an expert on darting. Barbara observed that Colorado was the only state that had its herds under the control of volunteer horse groups, and therefore they were the only state in the nation able to get their horse populations under control. Some of that is due to their smaller horse populations and the nature of the terrain and their ability to track individual horses. She felt that they need to bring some of that approach to New Mexico, which would allow them to get over the red tape. She spoke personally with leaders of the Cloud Foundation and American Mustang Preservation to bring them on board, and they agree that drones are probably where they need to go, but their overriding fear is that they will be perceived as giving support to the BLM for sterilization, and they are opposed to that. Most of the wild horse advocacy groups are totally opposed to sterilization, and that is the driving issue. As Evert said, trust is paramount.

Evert said that one of the biggest obstacles that they have had to overcome is that their requests to the groups for formal support in the form of a letter had to state the title of the grant request for applications, which is, “Wild Horse and Burro Sterilization and Contraception—Development of Techniques and Protocols.” That word “sterilization” is where the conversation

just stops—there is no communication after that. Their message to the groups is that they have deliberately separated the logistics issue from the clinical aspect, because some groups can't get past the word "sterilization." This is just a tool to get the horses in the corral, or deliver an injectable to the animal. But that conversation doesn't get through the word "sterilization," which is a big filter.

Evert has had several conversations with Dean Bolstad, and he's excited about the application, and Evert is confident that they will get the funding. Jerry asked how long it would take once the project was funded. Evert responded that the grant application deadline was today, but they don't know what the staffing levels are due to the 'draconian' federal budget cuts, and he expects that the Wild Horse and Burro program will get a lot of grant applications. As a consequence, he does not know how long it will take to review them. He feels that their application is unique. How long it will take is the unanswerable—they may hear by August 1st at the earliest, but once they have the funding they can begin to move forward. It will be a few months at best, but it could be several.

Tony expressed that he felt this was a tremendous program. There is currently an anti-drone movement in Taos that has resulted in a court injunction due to invasion of privacy, due primarily to their recently having been used to map marijuana plants. Evert said that they will start with outreach, probably with a naming competition—the military nomenclature around drones can be a turn-off. " They need to soften the image. The project has an opportunity to develop positive public relations. This is a hot-button issue, but also a "sexy" issue, which should develop enthusiasm. San Juan College's involvement can play a role in softening the image, too. Tony agreed that the College's involvement helped, and Myke concurred. Evert said that it must be carefully orchestrated to avoid problems. Tests will be done over public lands, in order to prevent the feeling that people are being spied upon. Tony said that the Society for Range Management will be in Placitas soon to discuss the horse issue—it is a tricky problem to address. Barbara observed that Patience O'Dowd is a formidable advocate for having the Placitas horses, which is a feral herd, defined as "wild horses."

Evert remarked that in dealing with difficult issues, society as a whole needs to get back on track with reason and fact. Disrespect for knowledge has brought us to this point—we have put opinion on a par with knowledge. Problem-solving needs to be knowledge-based, not opinion-based.

Myke inquired where they were in regards to the request to the Secretary of the Interior to try and drive a national consensus—even if the BLM had the technology for aerial gathering, if they can't get their EAs through, they can't do anything. Jeff Tafoya is in year three or four of his EA. Has anyone heard where they're at? Evert said that the day that he spoke with Dean Bolstead, he had the RAC's letter in hand and was drafting a response, to the effect that they want to see local involvement.

Myke asked where they stood at a national level with regard to the RAC's letter to the Secretary asking her to pull together a national consensus on the WH&B issue. Whether it's drones or helicopters to gather the horses, if the BLM can't get their EA through and they can't do aerial gathering, it doesn't matter how many projects they fund. Until there is a national consensus

among the advocates so that the BLM can write an EA—Jeff Tafoya's is in what, Year Four?—it doesn't even matter how they're gathering them, it just isn't happening. Has anyone heard anything about movement at the national level about creating that kind of symposium and consensus? Evert said that he thought so, because during his first conversation with Dean Bolstad, he had the RAC's letter in hand. That day Dean was drafting a response to give to the Secretary to send to the RAC. Dean told him that at the national level, they have washed their hands of it—they want local solutions. They want what happened in Colorado—they want someone locally to take ownership of the various herds and develop solutions.

Myke observed that socioeconomics plays a role in the number of volunteers in New Mexico vs. in Colorado—New Mexico ranks 48th to 50th in the nation for children in poverty. It's really hard to get involvement compared to Colorado, where they are ranked something like 12th. It's different for people who are fed, and clothed, and have a roof over their head, and they can start to explore other things. That's why it's really hard to draw on volunteer resources in New Mexico. He believes that they are misguided at the national level if they are waiting for local involvement and there is no consensus at the national level. Then local groups have the Cloud Foundation and others working against them—where are they funded from? Private donors in California and Colorado. So if the Farmington Field Office tries to do something at the local level, they have the Cloud Foundation and other groups like that, that have the funding and the resources, to fight them, and they won't be able to do it.

Myke did read the reply from the Secretary, and he found it somewhat short-sighted, because it has to happen at the national level. Then, instead, the Cloud foundation comes over at the national level, and they help the local groups. They say, "The national consensus is this," and if the local groups have gone off on a bit of a tangent, the foundations can help provide guidance. Groups at the local level need them helping them, not fighting them, and right now they *don't* have that.

Evert noted that the advocate groups don't feel that the solution will come from the BLM—they view the BLM as the enemy. Myke said that someone needed to be the catalyst—maybe the drone project can. Some needs to say, "you can sue the BLM, and you can do FOIAs, but we're still not solving the problem." Once they have a national consensus, then they can go to the tool chest created in consensus, and they won't have the challenges. Evert remarked that if they can create a consensus, why don't they also build a system on how to do it. The BLM needs to have a system similar to that with grazing and other wildlife and grazing permits—they need to establish the target numbers and have the interested community do the management. Myke noted that the drones are a wonderful new project, but he didn't want to see the technology available, and yet the BLM still couldn't get an EA through. This technique may improve effectiveness and animal counts, but if the BLM can't get the EA through…

Evert quoted from the last page of their abstract, "This project is intended to find the most humane solutions to improve the efficiency, effectiveness and safety of the methods used to suppress population growth and manage wild horses and burros. The project enlists the support of wild horse and burro and other effected public land stakeholders to guide the system of protocol development to ensure that the final product will be embraced by those

communities." He believes that the project will be considered failure if they cannot get the full support and endorsement of those communities.

Myke inquired if New Mexico Game and Fish were included in some of the advisory groups--even though they don't manage wild horses, they manage the wildlife being affected by the equine population pressure. Evert responded that they are trying to get all of the public land stakeholders involved. They've emphasized the WH&B community, because they feel that that is where the solutions have to come from. Barbara pointed out that if they don't get the support, it will wind up in lawsuits and stalemated forever more.

Evert observed that it was developing to the point that the situation was similar to the hares in Australia. Somebody initially thought they were a good idea… Supply has outstripped demand. Tens of thousands of horses have been adopted, but we are on the cusp of the horses becoming perceived by the public as a problem, and then the solutions will be reactive, and the outcomes will not be good. He said that there were two questions that the RAC needs to ask…1) why aren't they using drones to count the horses, and 2) why aren't the WH&B people talking to the wildlife management folks? Myke said he thought it was because they considered sterilization unacceptable. Evert pointed out that there are other techniques used for wildlife management that could be used for wild horses, etc., for herd counts. The National Research Council said that the herd count numbers lack credibility because they lack scientific rigor.

Myke addressed the question of population counts, and asked if drones could distinguish between wild horses and feral horses. Could a method be agreed upon? Barbara responded that they have to look at wild horse management areas—this population vs. that population, rather than individual horses. Jerry pointed out the Carson National Forest as an example—they are more than likely wild horses, with a few feral horses. In either case, they are overpopulated. Evert agreed that it was too fine a hair to try to split. Norman said that they were overlooking the number of people making money on the wild horse roundups—they may see resistance from those groups. Evert said that they would be bringing in roundup helicopter contractors for their expertise—regarding pressure points to move the herds, etc. They hope to bring them on board by including the roles that they still can play. The cost of a operating a helicopter vs. the cost of operating a drone means that they may be able to make more money, rather than less.

Myke raised one point about differentiating between wild horses and feral ones—feral horses aren't protected. Are they spending money on protecting feral horses, instead of wild ones? Evert agreed that whenever the word gets out with the Jicarilla herd in Colorado that there is going to be a gather on public lands, all the horses seem to magically go back to peoples' pastures and corrals.

BREAK (12:00-1:20)

Kathy McKim reconvened the meeting at 1:20.

Sam DesGeorges—Taos Field Office Update

Planning for the new Rio Grande del Norte is ongoing. John Bailey, the interim monument manager and Brad Higdon, their planner, will be discussing this further.

Brief update on the potential land exchange with Ohkay Owinge Pueblo: The pueblo is now in negotiations with landholders with inholdings within the new national monument, which they may be interested in selling. The Pueblo would purchase the lands, which they would exchange for BLM lands outside the Monument. This may accelerate the process of acquiring these inholdings—otherwise it might take 10 years for the BLM to acquire them. The Pueblo will acquire lands which are important to them, adjacent to the Pueblo, and the BLM acquires inholdings within the Monument. Otherwise the BLM would have to wait for Soil and Water Conservation District funding.

The TFO has received a new proposal for a transmission line, the "Lucky Corridor," from near Gladstone to the east across the Gorge to Ojo Caliente. The line would primarily run across National Forest land. The Forest has the ability to administratively approve or deny a proposal at this stage, and it is unclear which way they will go. The BLM is waiting for the Forest Service decision. It would run parallel and adjacent to the existing Tri-State power line—they are looking for an additional ROW. Perhaps a half a mile would cross BLM land, where it crossed the Rio Grande. The proponents have been told that because it is a multi-agency project, the BLM will not accept or reject it until they have the USFS decision.

John Bailey—Rio Grande del Norte Monument Planning

The BLM has been leading guided hikes, etc., since the monument was designated. They have created draft handouts and information sheets, which have to be reviewed and approved by the NMSO before they can be published. The guided hikes have been quite popular—they have been advertised on the radio and in the local paper. He has up to 1000 people on his mailing list, but he is still surprised at the number of Taoseños who have not heard of the Monument, even at a sustainable tourism workshop. The BLM is working in conjunction with local educators to address the disconnect between youth and the public lands. Working through the schools is part of a multi-pronged approach to get more youth engagement in all things pertaining to the Monument. They are looking at having special activities like "Backpacking 101," and there are local Boy Scout leaders who have experience in leading youth into the wilderness for nearly 50 years.

The monument was designated in in part in hope that it would help generate jobs—Las Cruces may have had some of their success in the designation of their new monument was due to the evidence based on Taos, which indicated that the designation of the Monument has had some positive effects on the economy. These are more anecdotal than quantitative, but there appears to have been an uptick in visitation due to the Monument. Photographers for the New Mexico True campaign will be in the Monument this week.

Myke asked if the BLM had plans to try to document the impact that the Monument has had on the local economy. John replied that the Taos Chamber has received funding to do research on increases in occupancy rates, lodging tax receipts, etc. It appears that starting about two months after the Monument was designated, that there have been some very positive trends. They are unable to determine if the increases are related to the monument from the numbers, but they have done interviews with about twenty hospitality and tourism operators, and based on anecdotal information, it is.

Myke pointed out that such information should be peer reviewed, since the funding is biased toward a positive answer. NPR reported recently on a well-publicized study that was composed of completely fabricated information. Since these kinds of studies are driving policy decisions, it is important to ensure that the data is sound—have to be scrutinized critically. The premise is that the Monument will stimulate jobs and result in an increased tax base. The BLM has removed 30,000 acres of land that used to be used to fund education in New Mexico.

Dave Evans responded that valid existing rights would continue. Grazing is a historic use, and it will continue. Myke asked about wind development. Sam stated that the proclamation specifically states that the prescriptions only apply to BLM land. Myke pointed out that there will still be expectations placed on the State Land Office that they will manage the lands in conformance with the rest of the monument, even though they are under State Ownership. At the federal level, they have made changes that will make it very difficult for the state and private individuals to make changes.

Tony pointed out that the prescriptions on the federal lands did not apply to the surrounding non-federal lands. Myke pointed out that there will still be expectations generated regarding the ways in which they will be managed, and Sam agreed that there may be.

John said that the State Land Office has expressed that it would be interested in doing land exchanges, based in part upon those expectations and the lower revenue streams as a result. Myke reiterated that careful consideration has to be made, when lands are withdrawn from other development, especially with regard to jobs and taxes. That is why studies like those done by the Chamber are important, but they have to be validated.

Brad Higdon (Planning Specialist, TFO) informed the RAC that they recently concluded the scoping period to determine issues, conflicts, etc., to consider during the monument planning process. They have received 12,000-14,000 comments to date, although only about 150 of these were unique (many were form letters). Shasta Ferranto put together the scoping report, which is now available online. The resulting document was about 100 pages long. They captured all the substantive comments, and also did internal scoping to identify the issues and how to address them, and still stay aligned with the objects and values cited in the Presidential proclamation, and what other additional opportunities there are out there. Issues statements are presented in the form of questions and are fairly broad, but the objective of the monument plan is to create broad-scale management guidelines, which areas are defined for which uses, etc.

A lot of the public comment wanted to jump to activity-level decisions, rather than planning-level ones, but they aren't to that stage yet. They also identified data gaps and needed inventories (e.g. the visual resource management information is out of date) so they are re-inventorying for wilderness qualities, etc. The criteria used for identifying lands with wilderness characteristics were also out of date. There are also pilot programs with the BLM and US Geologic Survey to determine what socio-economic elements should be considered. They are working on a non-market values assessment—how do they qualify clean air, clean water, visual qualities of the landscape—things that contribute to the quality of life in Taos County, and how they contribute to the economy. Just yesterday they learned of a project that helps to determine what kinds of socio-economic issues need to be evaluated for any given proposal. They will be working with a sociologist out of Phoenix. This will provide project-specific considerations for evaluating alternatives, and this is also something that the public is demanding.

Once the data needs are determined, then the next step will be to develop alternatives. The "No Action" alternative would be the same as the current RMP. They need to craft goals and objectives—not to make them substantially different, but to fine-tune them. They anticipate that the goals will be consistent across all alternatives, but some of the objectives may be unique.

Next week they will be bringing in a facilitator to work with the ID team and cooperating agencies to create a collective vision for the area. They've also invited a number of cooperating agencies to participate in the planning, and have received considerable interest. They have already signed Memoranda of Agreement with the Soil and Water Conservation District, New Mexico Game and Fish, and the State Historic Preservation Office, which is unusual. It makes a nice balance.

Evert commented that one resource to consider at is the Yellow Wood Associates out of Vermont—they have developed a holistic approach to evaluate all of a community's capital—not just financial—and how the community can cooperate to leverage all sources of capital, including natural and social, to create prosperity. The model is called "WeathWorks."

Brad responded that the BLM had recently received an Instruction Memorandum from the Washington Office that these factors needed to be considered, so they are still in a learning curve. Evert observed that this was a good opportunity to involve the whole community in formulating a broader vision. Brad directed the RAC members to the site where they could find the scoping report:

http://www.blm.gov/style/medialib/blm/nm/field_offices/taos/taos_planning/rgdnnm_docs.Par.18845.File.dat/RGdN%20Scoping%20Report%205.22.14.pdf

Sam commented that one reason that visioning was important was that it has been used successfully in the past. The vision was that economic opportunities would be pushed to the local community and entrepreneurs. That visioning guides decisions. For example, would the BLM develop RV dumping stations, or would the community develop them? They decided to let the local community develop them.

John said that the issue of “Adaptive Management” has come up, but they are still learning what that means, and how visioning plays into it. They may try to bring someone with experience in this kind of planning to come in and train them. They have tried to do it in a more informal manner in the past, in the Rio Grande Corridor, for example, in the planning process. They have certain use levels for commercial vs. private boaters. Commercial boaters have requested to make occasional use of the private boat launch points, provided they do not interfere with the level of private use. They developed a pool system to allow that, and it has been of considerable benefit to the commercial sector.

Interbrand has contracted with the BLM to help brand their new monuments, so the websites, signs, etc., have a consistent format. It is in the early stages. They should see the results soon, and there is about $100,000 set aside for signage.

Dave remarked that the monuments are a gift, but they come at a cost, and they have to draw on their base funding—there is no additional money set aside to manage or develop them.

John was recently at a sustainable tourism conference, and was asked “What do you *really* need?” to help push forward the development of the Monument, so they may reach out to the local community to help determine that.

Evert observed that this was important, because if the community takes ownership, vandalism and dumping goes down, etc. John said that they had been reaching out to local experts to lead hikes—this *is* the people’s monument.

Brad said that they have done consultations with local tribes, some were done face-to-face, including the Hopi, Southern Ute, Taos Pueblo, Picuris and Ohkay Owingeh. They hope to be able to meet with them again as the process continues, and hopefully others as well. This has been an important part of the scoping process.

Kathy asked if the effects on these communities were considered direct or indirect, and Tony replied that they would be direct on Taos Pueblo, and indirect upon the others. Tony also said that he had reviewed the scoping document, but that the lack of an index or table of contents made the 127 pages difficult to navigate. He also noted that the section on wild horses appeared to have disappeared, although it was present in the draft. Brad indicated that it did have a table of contents, he isn’t sure why it didn’t come up.

Myke said that he noticed that the scoping document had a number of references to aviation, and asked if the FAA had been approached as a cooperative agency. There were concerns about private aviation, contrails, and military flyovers—perhaps those involved should be approached as cooperating agencies, as well. He would suggest approaching the FAA and the Department of Defense, because they regulate the military overflights. Sam observed that in *theory*, there were no military training overflights of the area.

John responded that it hadn’t occurred to invite them as cooperating agencies—it is a big time commitment for agencies, but they can invite them to consult and advise them regarding the public concerns. He did receive a call from the FAA in Florida, who said that if the state director were to write a letter to them, they can put it on future maps for private pilots…small steps may

go some ways to address some of the concerns. Tony observed that aviation is a small point, driven by a small number of activists. Myke responded that if they didn't address it in the planning stages, it would have to be addressed in litigation. Tony remarked that there is not a lot of science underlying the aviation concerns at this point.

Myke then asked if additional mapping of cultural sites be done to aid with the EIS, or if that would be done afterward. Sam responded that only 10-13% of the Monument had been mapped thus far. Myke noted that in the Mancos EIS, they are doing studies a variety of additional studies in conjunction with the EIS, so that when decisions are made, there are concrete studies that can be pointed to. He observed that in the Monument document, there were several ecosystems or bioregions that were identified. He wondered if any had been mapped or if mapping was being considered as part of the document or the subsequent management. Tony responded that there are three major ecosystems, and how you monitor and address them is hard to break up.

Myke recalled that the FFO had identified vegetation zones, so that when reclamation was done, there was a standard of expectation. He noted that the New Mexico BLM has a huge initiative—Restore New Mexico, but that the goal was not to restore it to its current condition, but some perceived past state. He then asked the intent of the Monument—to preserve where it is today, or to restore it to a past condition? Sam responded that they had had the same discussions with their ID team—vegetation communities, by definition, are dynamic. Myke said that that was what he was getting at…past management practices have already altered the land. Where will the bar be set?

Sam noted that that was an important point—they are not putting up a wall around the Monument. One of the challenges is to be adaptive and to know when things are changing. Is it important to have some unmanaged lands, too? All of this is part of management, and monitoring the indicators. Myke pointed out that metrics are a critical component of adaptive management. The plan needs to recognize that what it is today isn't what it used to be. Tony observed that a lot of that fell into the Range Management section of the Scoping Report, and would be discussed further on the field trip he'd lead the next day. Unfortunately, there isn't a lot of data for this area. Down in Las Cruces, where they have a lot of checkerboard management in the new monument, issues are even more complex.

Myke asked what the standard was for restoring grasslands—to Spanish arrival? That is limited by our ability to look back historically. Ecological diversity is the result of a wide variety of past issues, and is also a big mandate. John said that there are also a lot of wildcards as a result of climate change, too. They had hired a range ecologist about a year ago, and have interns coming in for a couple of years, in order to help create a baseline. Tony noted that there had not been a range ecologist working in this area for a number of years, and there are no ecological site descriptions. Dave added that the BLM has an agreement with folks from Jornada to do an ecological site description. Tony observed that folks from down south have no experience with the high desert—this is a completely different world.

Evert pointed out the difference between strategic planning and strategic doing—there is a need to get the community involved. Dave responded that the scoping is the first step in a process.

John observed that the BLM figured out that if you go to the 'coffee shops,' you get a pretty good cross-section of community sentiment. They're still figuring out how to do that.

Brad Higdon—Planning 2.0

Brad informed them that the Washington Office has a new initiative, and have asked the field offices have been asked to present it to groups like the RAC. It is called "Planning 2.0," and is aimed at building a more efficient, durable and dynamic planning system, and is being led by Shasta Ferranto. It will be necessary for the agency to review the handbooks—it has been about ten years since the last planning handbook came out—there have been more case law, more experience gained, more Instruction Memoranda, etc. Hopefully the result will be less time and less money expended in the planning process. They plan to determine where they are going, but it is also determined to some extent by the law, such as FLPMA.

How does the BLM plan? First, they comply with NEPA, FLPMA, and other federal laws. FLPMA, passed in 1976, mandates that they develop and periodically revise their land use plans. They develop goals and objectives—this is also good practice. There are certain steps: they involve partners who help incorporate local knowledge, etc. as mandated by NEPA; and look at federal law, local policies, etc., in accordance with FLPMA.

The objective of Planning 2.0 is to improve the way the BLM works—time management, budget, etc. They are currently updating 43 CFR 1600, improving the regulations as part of implementing Planning 2.0. They will also modify the handbook in response to the updates to the regulations. The Washington Office wants to know what parts of the process need to be improved, and how they can simplify the process, improve understanding, and are there more effective ways to engage the public and cooperators in the collaborative process? Input can be provided to blm_wo_plan2@blm.gov. Comments received by the end of June 2014 will be the most helpful.

Myke asked when the new regulations would be available. Brad responded that it was anticipated to be a two-year process, but he wasn't entire certain of the individual steps. Myke asked if there would be a public comment period on the regulations or the handbook. Dave replied that there would be a comment period on the regulations, but not the handbook. The regulations would of necessity precede the handbook. Myke said that he thought it was important for the RAC to be apprised when the regulations are formulated—that that was a key role of the RAC. Barbara asked if that would allow them to limit factors such as the number of comment periods—could the comment periods be limited to one? Brad responded that the number of comment periods is governed by FLPMA and NEPA—the laws themselves would have to be changed. Barbara observed that that meant that in order to really improve the process, they would have to change the legislation. Gary said that the likelihood of changing the laws was small, but that the individual agencies *interpret* the law, and that becomes the basis of the regulations.

Myke sought clarification: the acts result in the federal laws that are the bases for the agency regulations, which codify how the agency will execute those laws, and then the agencies create the handbooks based on the regulations. Gary provided an example: the law states that "we want clean air," the regulations define "clean air" as X number of parts per million, and the handbook says, "this is how you will get there." Dave added that once the regulations are promulgated, then case law begins to refine the regulations.

Barbara said that she had been wondering what she, as a citizen, could suggest making a difference in the complexity of the process. It is really hard to make a substantive change. Dave observed that the complexity and protracted nature of the process is the basis for the reluctance of cooperating agencies to sign on. Often they are committing to several years of effort.

Myke noted that at the recent NMOGA public lands meeting, the Park Service did a presentation on "soft resources" such as soundscapes and dark skies. He asked if they had done NEPA, and they responded that they had done it at the national level, not at a park level or regional—now the NPS is trying to come on as a cooperative agency and manage at a local level based on the analysis they did on a national basis. They are now trying to impose some of these "soft resource" standards at a regional or local level.

He gave kudos to the BLM for trying to do things at a local level, in spite of the arduousness of the process, so that when it begins to knock on the public's back door, people know what is going on. Barbara cautioned that sometimes the microscope can be focused too fine, and it results in lawsuits, etc. Myke agreed that the question of how many times one has to allow groups to comment, etc., in order to prevent lawsuits can be problematic. He explained that if non-profit groups sue, the taxpayers fund that—the federal government reimburses them. As a result, the Endangered Species Act has basically been rewritten by lawsuit, and the taxpayers have funded it. Essentially, there is nothing to stop them, and effectively private groups get paid to sue the government. Dave responded that they have sliced the salami so thin that it only has one side. With regard to the issues with the NPS—the BLM only manages BLM lands, and has no management criteria for these "soft resources." It will try to consider such factors as dark skies, but how much of that is defensible will be determined going forward.

Dave said that he was not sure if there was a NEPA process behind the "dark skies" designation, because that is a product of an international astronomical group. Myke assured him that there was not. He pointed out that the NPS has adjusted how they manage the Park [Chaco], but are now trying to extend it beyond the Park. Gary agreed that it is a strategy on the part of the NPS to extend their protection to a buffer zone beyond the boundaries of the Park. He pointed out that the BLM has never drilled a well inside the Park boundaries, nor are they proposing to. Myke asked if the BLM anticipated doing the same sort of thing around the Monument, and was told "no." John remarked that they did have a scoping comment asking that they consider dark skies.

Kathy McKim called a break, noting that the Public Comment Period started at 3:00, and they could continue the discussion after that.

BREAK (2:45 to 3:04)

Reconvened by Kathy McKim at 3:04. She observed that no members of the public had arrived to comment, but they are open for comments until 3:30. In the interim, Christine Horton had some information regarding travel.

Christine informed the RAC members that she only needed their receipts for the hotel—they could leave a copy at the front desk, and she would pick them up. She would also need to know where they departed from to come to Taos, and she will submit that information. They will receive ¾ per diem for Taos for the two travel days, and full per diem for the two meeting days. Per diem will be direct-deposited to their bank accounts. Also, they will meet here for the field trip at 8:15, and will end at 3:30. Tony added that they can leave a car for part of the time by dropping a vehicle at the Old Blinking Light, as they will be coming back past later. Since the Old Blinking Light is no longer a blinking light, John suggested that for future field trips the description be revised for public use by non-Taoseños. Tony noted that he had provided road logs for the trip, including for the entire route back to Farmington.

Christine asked who would not be able to participate in the trip—Evert and Barbara would not.

Sam observed that the Monument is c. 244,000 acres—this field trip is just a taste. He asked that all would please come back and see it—it is 65 miles long and about 30 miles wide at its widest point, and about half a mile at its narrowest—tomorrow they will just see the high points, and the places where most of the public will visit. Hopefully this will pique their interest. Christine extended thanks to Tony and Sam for preparing the field trip for the group.

Myke asked if permits would be required in the backcountry, perhaps as a matter of public safety. Sam responded that that would be part of the adaptive management, they may implement it as necessary for some areas.

Kathy observed that as no members of the public had yet arrived, they could continue with the discussion of the planning process.

Myke suggested that as the BLM goes into Planning 2.0, that they use the RAC as a sounding board and support, as they did with the Wild Horses and Burros and the Glade.

Sam said that one of the positive things about being in the Taos Field Office so long is that he has actually *seen* plans happen—even though they all hate planning, he's to the point that he's been able to see the results of all the planning, such as with the return of river otters and bighorn sheep. Dave recalled that his grandmother used to say that people didn't plan to fail…they fail to plan. He observed that the Taos Field Office has done an excellent job of planning and commended the staff. The Farmington Field Office is in the midst of a $3.5 million plan amendment. A full RMP costs five to seven million dollars. The Rio Puerco Field Office is in year seven of their planning process. The Taos Field Office folks know how to do it right—they only had about 85 comments that they had to resolve for their final draft. Working with the public and with stakeholders really does pay off.

Myke observed that the plans only have a 20 year life. Dave replied that amendments can extend the life of the plan. Plans are difficult, and they are hard to afford—monetarily, time-wise, and staff-wise…they burn people out. Sam noted that once a plan is finished, and implementation starts, people actually look surprised. The challenge is to keep people engaged. Dave cited the example of Cebolla—they started planning in 2007, and gave folks opportunities to comment. They deferred leasing in that area during the entire planning process, they though that they had engaged everyone—then when they nominated parcels for leasing, the reaction was "what do you mean?" They were given opportunities to comment, but now it may result in those parcels being withdrawn.

Myke asked what other big plans or projects they had been approached about. Dave responded that there is a proposed clean energy project, a 720 megawatt facility with 680 being from natural gas and 40 MW of solar on private land. The BLM's part would be the rights-of-way—about eight miles of natural gas pipeline and a two-mile connect line to the main grid. The company actually wanted the BLM to *do* the EIS. They respectfully declined, but will be a cooperating agency. There are also a number of large pipeline proposals.

Myke asked about the Navajo Nation spur railway from Thoreau. If it is mostly on BIA lands, would they be the lead agency, and the BLM be a cooperating agency? Dave responded that they would. Gary also remarked on the national EIS planned for the Old Spanish Trail—they may want more specific plans at the field office level. They are also involved in travel planning. Dave noted that the Forest Service has the ability to "administratively set aside" proposals as they come in, if they don't fit their criteria. The BLM cannot. Myke asked if that was based on the Code of Federal Regulations, and on different interpretations of the Council on Environmental Quality. Dave said that it was. Myke asked if that was something that could be changed in the future—to change the regulations to give the agency more flexibility and streamline the process. This may be the opportunity for that—to examine the regulations used by other agencies that might be adopted. Dave said that one reason that the Forest Service favors administrative dismissal is that they can see that the process is fraught with pitfalls, and they anticipate litigation. This is why the EAs have gone from seven pages to fifty or a hundred pages. Gary said that if one were thinking outside of the box, the National Parks Service, the BLM and the Forest Service would be part of one department. Every time Congress considers this, there is considerable opposition.

Evert observed that the White House created a Council on Rural America and brought the department secretaries together with that objective, to consolidate functions, but their positions were entrenched. The Secretary of the Department of Agriculture is trying to consolidate functions within his own department, and hasn't been successful. Myke agreed that the objective was good. Evert said that at least the conversation is taking place. Myke saw the Planning 2.0 as an opportunity for them to look at the regulations in other agencies, and see what might be added or adapted. Tony observed that when you compare the BLM's public perception to that of the Forest Service or the Parks Service, they look like a "shining light." Gary noted that the National Parks Service gets $20 an acre to manage their lands, the Forest Service $7-8 and the BLM gets about $2.

Tony asked if the RAC needed to do anything more with regard to the wild horses and burros, and Kathy asked if there were anything more that the BLM wanted from the RAC. Dave said that he was very pleased with what had been done already, it was more than he had expected. Unfortunately, due to overcrowding and lack of demand, the Bureau's captures are driven by court mandates and dire conditions. Gary said that the RAC's attention to the issue has raised wild horses and burros to the top five list of priorities that the policy-makers are considering. Dave said that as a result about $3 million had been set aside in 2014 to improve the science surrounding the issue—to look at biological controls, etc. Gary noted that the letter that the Farmington District RAC sent to the Secretary has trickled back down to the Farmington Field Office to create a symposium. So, the Farmington Field Office, at some point, will have to start organizing a symposium. He is not surprised, that it went up, it came right back down to the office that generated it. It *is* a fact that it is now a Top Five priority.

Evert informed the group that he had just received a message that the College's grant application had been filed—if their application is successful, the symposium would be a great launching platform. One of the cornerstones of the College's interest in the project was as a conflict-resolution mechanism. Barbara asked if the notes from the BLM's wild horse meeting in Sacramento was online, and Dave said that he was sure that it was.

Myke asked if there was anything more that needed to be done on the Glade. Gary said the priority was just to finish the document. The RAC's letter of support was very helpful.

Dave said that at the next RAC meeting they may give an update on Planning 2.0, and may ask for a deliverable at that time.

Barbara asked if the "Top Five" list was available to the public. Gary said that he would send it to Christine, who would send it out. Dave said that helium was also on the list. Tony asked what the helium issue was, and Dave explained that the NM State Office manages the country's strategic helium reserve, and the helium plant in Amarillo is a BLM facility, which then sells to commercial suppliers. Gary added that helium is one of the strategic minerals, and the BLM is in charge of basically managing the whole US supply.

Gary added that he knows that some RAC members' terms are expiring, and he encouraged them to reapply for nomination. In part, it is about relationships, but it also takes some time to learn how the BLM works and talks. He realizes that it is a real sacrifice on RAC members' parts. They hope that the RAC can get past just the "update" stage, so that they can give the kind of feedback that the BLM needs.

Myke asked what they thought of the meeting format that the RAC used now, versus the one used two years ago, and that they have put more emphasis on the BLM personnel not only providing updates, but indicating how the RAC can help. Dave said that this was the highest-functioning RAC he had been associated with, and due to this RAC's interactions and the change in the format of the meetings, so that they are providing feedback back to the agency. The things that this RAC has drawn to the attention of the Washington Office have come back to the field office level faster than usual. He is appreciative of the changes that they have recommended, and the structure. It has been very beneficial. The deliverables that they had

provided were unparalleled. The RAC also has the ability to reach out to disenfranchised constituents, and have more credibility.

Tony felt that the local RACs work better than the old state-wide RACs, which really only served as information sessions, but he would like to see more Taos residents and more recreation folks get involved. Kathy asked who would be reapplying, and when the next meeting would be. Christine responded that it could be scheduled during the October to December window, depending on when the new members are selected. Myke's, Tony's and Evert's terms are expiring in July. Evert is the only one who has not reapplied. The RAC would not have a quorum until they have the new members. Kathy's, Nickie's and Barbara's terms will expire in July 2015. Christine said that she will continue to forward updates on matters like the Glade, etc., to members between now and the next meeting.

Evert expressed that he had enjoyed serving on the RAC, that it was a delight, and a good bunch of people. He is more engaged with the College on the drone project than he had intended, and he would prefer not to appear to have a conflict of interest. He is also involved in developing geo-fencing, and would be interested in selling it for public land management. He also feels that it is important to have new people coming in, although it has been delightful.

Dave said that their service was appreciated, and that the RAC is a great communication tool. That is probably part of the reason why this RAC is so successful—it has confidence in the projects. Although he feels that though there would not be a conflict of interest for Evert, it is good to be cognizant of the public's perceptions.

Myke asked if there were anything on the tour tomorrow that those who could not attend should know. Tony responded that it was basically a chance to see first-hand what the public sees when they visit the monument.

Myke moved that they adjourn, and was seconded by Barbara. Kathy ruled the meeting adjourned at 3:53 p.m.

May 29, 2014 Attendees:

RAC Members (Category):	BLM Staff:	Visitors:
Anthony Benson (3)	Dave Evans, FDM	Martha Brown
Michael Lane (1)	Sam DesGeorges, TFO	Carolyn Norvelle
Kathy McKim (3)	Gary Torres, FFO	Bev Evans
Norman Norvelle (3)	Maureen Joe, FFO	Michele Jacquez-Ortiz
Jerry Sims (2)	Christine Horton, FFO	Jennifer Manzanares
Nickie Vigil (3)	John Bailey, TFO	
	Merrill Dicks, TFO	
	Brad Higdon, TFO	
	Allison Sandoval, NMSO	
	Theresa Herrera, NMSO	
	Leslie-lynne Sinkey, FFO	

Field Trip

The group rendezvoused for the field trip at the Taos BLM parking lot. Information packets including maps, diagrams, trip logs, etc., were distributed. The group set out at 8:30 a.m. Please refer to .pdf of information packet for details. The field trip was kindly led by Tony Benson.

First Stop: Taos Valley Overlook

Much of the acreage in this area was purchased by the Land Trust Alliance from the family that owned it. This is the first stop in the Monument for people coming from the south.

The Presidential Proclamation that created the monument talked about how 70 million years ago (MYA) this area was the east part of the Pacific Ocean. The Farrallon tectonic plate slid under North America, and this area was compressed upwards. The faults in this area were probably thrust faults then, then later, as the Colorado Plateau started to rotate, these same faults became wrench faults, moving sideways. In the last twenty-five million years, when the western US started pulling apart, forming the Great Basin and basins in Nevada, then you have had rift valleys forming, and these faults now have become normal faults. It is a very complicated picture, as the same faults go from compressional to wrench to normal.

The Taos Valley Overlook provides a view to the west of the Taos Plateau Volcanic Field, which contains forty volcanoes ranging in age from two to five million years old. Most of the hills that can be seen are volcanic, although they vary in the types of rock that compose them. The large hills to the northeast, including Tres Orejas and Guadalupe Peak by Questa are dacite volcanoes, as is Ute Mountain near the north end of the Monument. The dacite volcanoes are more resistant to erosion, and tend to be quite prominent. Ute Mountain is actually a dacite volcano on top of an andesite volcano. Other andesite volcanoes, which are more prone to erosion and tend to be lower, include Cerros de los Taoses and Cerro de la Olla. Underlying all of them is the Servilleta Basalt, which composes most of the Monument. The basalt was very fluid, and flowed all the way to Española. The only hill to the east which is not a volcano is Cerro Mojino, which is a domal uplift of the overlying basalt. Most of these volcanoes have

been re-dated using the new Argon 40-39 technique—the better-known potassium-argon technique was less accurate.

The Stakeout Ash Bed at Stakeout Road listed on the Road Log is no longer visible—it has been covered up. It is a one-foot layer of white ash from the Jemez Caldera fifty miles away, about 1.27 million years old.

The Taos Plateau starts to the west near Tres Piedras and dips east against major faults along the base of the Sangre de Christo mountains. The large peaks, such as Taos Mountain, are pre-Cambrian in age, about 1.7 billion years old. When you reach Taos, there is a fault running through Taos Pueblo, and to the south are Pennsylvanian rocks, which are hard limestones and sandstones, and are rich in fossils.

The Picuris Mountains are just to the east, and the low hills along their base are a result of that fault swinging west and becoming a strike-slip fault. Because of the complexity of the faults in this area, it was not far from here that the Apollo astronauts were trained to identify different geologic features that they found on the surface of the moon. Some of the alluvial fans along the base of the Picuris Mountains to the east are quite young, dating from the middle to late Pleistocene. The abundance of trees and sagebrush in the area are due to the deep loess—windblown soil. Out on the plateau, when the rain does fall, it runs off very quickly.

Some of the faults in this area are still moving. You may have heard of the "Taos Hum." There is a deep wrench fault that goes down the valley to Pilar is probably still moving. The bad part is…they haven't heard the "Hum" in ten years, so when it moves again, there will be another fault. Tony has not heard the "Hum" himself, but he believes it is real…it was probably a low-frequency move on the deep fault.

If you look south, you can see a white caliche bed on the top of the hill. This is a Holocene caliche layer that has been uplifted by the fault behind it. The deep fault that goes south to Española has a "positive flower structure." As the fault moves at depth, the gravel beds overlying the fault splay out at the top, and these structures are important to the oil industry. This is what you see at the horseshoe curve just to the south.

The Rio Grande Rift is a one-sided rift, like a trap door. When you get down to Española, the dip shifts the other way, and the fault runs through Los Alamos. The enigma in Taos is that there are no earthquakes in recorded history. There is a legend at Taos Pueblo about earthquakes, and there is a fault that runs right through the Pueblo that is about 7,000 years old. There is another series of faults that trend north-south under the Plateau, and four or five wrench faults in the Picuris Mountains. The Ponce de Leon hot springs are on one of these. These faults are also off-setting the Servilleta basalts that underlie most of the monument. Some geologists believe that these wrench faults result from the rotation of the Colorado Plateau.

The water table dips very gradually (about a 1% incline) from the mountains toward the Gorge. Although the rivers in the area appear to be dropping the past few years, rainfall in this area is very cyclical. We have records going back for 100 years, and there is a pattern of swings from a few years of above-average rainfall to a few years of below-average rainfall, and back again. In 1999 Taos recorded 0" of precipitation. The Tree Ring Research Lab has reconstructed rainfall based on growth rings on trees, going back 400 years, and the same sort of cyclic pattern appears.

The Department of Agriculture puts out maps to help ranchers predict which pastures to move to, based on weekly precipitation. It demonstrates the patchiness of the rainfall in this area—some areas may be above normal, and others may be below. The summer monsoons can almost vary mile-by-mile. When you see maps that show that our portion of the state is in "Exceptional Drought," there may be areas within that where it is not "Exceptional" at all.

At a recent conference, there were 26 models presented predicting what impact climate change would have on northern New Mexico. Thirteen or fourteen of them showed that it would be warmer and drier, and the other twelve or thirteen didn't.

Second Stop: Chiflo Overlook

This site provides a view of a lot of significant geological features. On the way here, we passed over the old Questa caldera, and could see the hydrothermal alteration scar in the tuff. You can see San Antonio Mountain to the west.

This area is largely composed of Servilleta basalt. If you pick up a fresh piece, you can see the crystals in it, which is unusual for a basalt. If you didn't know it was Servilleta, you might call it a gabbro because of the large crystals and intercrystaline porosity. It is very characteristic of the Servilleta basalt, which largely lies in horizontal flows, and can be found from Colorado to Española. Volcanic rocks are defined by the amount of silica and other minerals, and to determine what type they are you usually need a laboratory—they all pretty much look like dark grey rocks. The peaks are primarily composed of dacite, which is a more resistant rock—prehistoric peoples used it to make projectile points. Interspersed amongst the dacite are some deposits of tuff, formed from the ashfalls from the volcanic eruptions.

Off to the west you can see a timbered hill, which is rhyolite dome that we'll discuss later. Far to the west, beyond Tres Piedras is a series of rhyolite domes that they mine for perlite and obsidian. Generally the ash tuff is on the rhyolite formations, due to the high silica. The Servilleta basalt does not appear to have ash associated with it. .

Across the gorge you can see a rather unusual formation. The top of the Servilleta basalt here is about 3 million years old, and butts up against a highly banded dacite dome that is about 5 million years old. The dacite is very distinctive from the basalt, with its flow banding color—sometimes it even has a pinkish tone. The dacite dome was already sticking up from the surroundings when the basalt flowed around it. The basalt in this area is about 500 feet thick.

The BOR drilled a number of deep cores in this area when they were considering damming up the gorge to create a lake. They actually lowered the drilling rigs down the Gorge on a cable.

A number of methods are used to date the volcanic structures in this area, some of which we've already discussed. Another is based on the fact that the polarity of the earth's magnetic field reverses periodically. The poles wander, and the weakening of the magnetic field suggests to some that we may be due for another reversal (in the next 100,000 years or so). The polarity and angle of declination of the rocks at the time they were laid down has been established, and it helps to determine how old they are.

In the last ten years, the geological work on the Monument has focused on high-resolution aeromagnetics. The USGS flew a series of flights over the Monument

There used to be a huge lake north of here in Colorado, north of the San Luis Hills. The sands that formed the bottom of the lake still hold water, and were the source of a lot of the artesian wells used for irrigation in that area. More recently, these artesian sources have dwindled. Lake Alamosa has been mapped, and it appears that it existed until about 440,000 years ago. At that time, in the late Pleistocene, Lake Alamosa cut through the San Luis Hills, cut through a couple of volcanoes, and added all its contents to the headwaters of the Rio Grande. That was what began the creation of the Gorge, so the Gorge itself is relatively young. The rift valley itself has been dropping for 25 million years, but the headwaters used to come out of the Red River, south of this point. That started the erosional cutting of the Gorge. There are two distinct features—the rift is the 25 million-year-old eastward dip, which is still moving downwards. The down cutting of the Gorge itself probably happened fairly rapidly, within a few thousand years. The Gorge is erosional, and the rift is geologically structural. The rift forces the river east, and the alluvial fans coming off the Santa Fe group force the river west, so it confines it in this location. Then the water was able to cut down along the faults when Lake Alamosa began to drain. It is also hypothesized that there may also have been Lake Sunshine in this area.

Before the Servilleta basalt was laid down five MYA, this area was an internal drainage that started to fill in the Sunshine Valley with fine silts and sediments—there was no river that drained this area. About 440,000 years ago the drainages began to be entrenched—the Cerro Valley, the Latir Valley, and then later these valleys began to fill in again with younger, coarser gravels and sand. All of this history is important for the groundwater of the area. Latir Creek was diverted down the Cerro Ditch, and so there is no longer any flow in that canyon. Some of the Santa Fe group lies above the basalt, and others lie below it.

The water table in this area dips west from the mountains toward the Gorge. Water level records have been maintained almost yearly back to about 1955. They are monitored twice a year, and it appears that they are about the same as they were in 1959. In the 1950s and ‘60s, this was the potato capital of the world. They irrigated it until the soils became so saline that potatoes would no longer grow, and the soil developed a white crust. As a consequence, the sagebrush that we see today moved in. We passed a plot a ways back that was full of grass—it was disked and re-seeded by the BLM. They disked out all the sagebrush and changed the succession—it was planted with a mixture of native grasses. There is a fair amount of snakeweed in it, but snakeweed only lasts seven years. We’ll talk more about sagebrush at the last stop. There probably wasn’t as much sagebrush here 100 years ago.

In the 1970s the water table rose about 20 feet due to the discontinuance of irrigation. In the last five years, it has dropped five to ten feet in all the wells. In one well, they can actually hear the water falling, from the shallow water table down to the deeper aquifer. It hasn’t dropped at all. The flow in the Red River echo’s the pattern of the water table—it generally takes a couple of years for water to travel from the mountains, through the water table to the river. It recharges the river through underground fractures, or comes out in the Cerro Ditch.

There is a movement to try to prevent water transfers of water to Santa Fe. The State Engineer allowed water transfers from east of the Gorge to west of the Gorge. It's a matter of shuffling "paper water." They drilled a series of deep wells, and a lot of these wells have a downward pressure gradient.

The water table in the upper Sunshine Valley is very interesting. San Pedro Mesa is capped by Servilleta basalt. It is up-faulted, so there are faults here that are younger than 3 million years old. Although they used to believe that there was a perched water table, but now that they have drilled deeper wells, and they will be hiring someone to correlate the data. They had predicted that, based on the number of wells that have been drilled for domestic use, that the water tables should drop by about 40 feet…but they don't see them dropping. The mountains are the largest recharge region in New Mexico, other than the Chama River. Although there doesn't seem to be enough "paper water" to go around, and some groups will have to buy water rights, the technical data paints a less dire picture. In the Taos Valley, there are 10,000 water wells…and they don't know where any of them are. The State Engineer has a database, but all of the locations are wrong…most of them are wrong by more than a mile, and the depths are wrong. This is the data that they built the original models on. The water flows west to the Gorge…they got that much right. He participated in a survey down in Talpa, and went out and looked at fifty wells with the mayordomo that were listed in the State Engineer's database, and all of them were mis-located. The other fifty wells that they *did* know about, and they knew who the owners were, weren't in the database. Some of the wells are ten miles away from their supposed locations. All of the hydrologists rely on the State Engineer's maps, but they are all wrong. The problem is that a lot of the wells were located using metes and bounds from the nearest tree. The drillers had no idea where the wells were. They finally have GPS, but even that creates problems—the GPSs use UTMs, with the measurement in meters. If a location was recorded in lat-long (degrees, minutes and seconds), you can't find the point on a contour map. UTMs you can plot. And the State Engineer uses X-Y feet. Ten years ago they took ten students from UTM, and located the sites on the ground, and that is the only correct data. Tony said that he didn't know if they had the same problem in San Juan County, where they had the Public Land Survey System. Myke replied that sometimes they were located by quarter-quarter, or sometimes quarter-quarter-quarter, and some are just "in the northeast quarter." Tony remarked that that was an improvement...at least you are within 1000 feet of the well.

Sam remarked that some of the work that had been done in the area was to age the water from some of the springs. It was really fascinating—some of this water is 8,000 years old. They have actually radiocarbon dated the water coming off the Tusas Mountains—irrigation is problematic, because it moves so slowly. Across the street from Tony's ranch, they irrigated back in the '40s, and the water table is still coming up from 60 years ago—essentially, they are mining ground water. Most of the water on the east side of the Gorge is coming off the mountains and is only two to ten years old. New Mexico Tech probably has the best program in the nation for hydrology, including having an acquifer mapping group.

Tony said that some research had recently been done that indicated where the water was coming from. They used to believe that a lot of the water was coming from the San Juan Mountains, but there is a groundwater divide that runs along the San Luis Hills, and north of that

the water flows into the Alamosa Basin. Water that falls on Ute Mountain appears to run down fractures into the deep aquifer. Water from the mountains appears to flow down the fractures—the levels may seem high in the spring, but they drop considerably by fall. Fractures don't hold water well. You can see the fractures in the rocks across the Gorge—the total volume of water is probably less than 5%. When you get out into the gravels in the valleys, you have about 50% porosity, and it can hold a lot more water, and it drains more slowly. When the molybdenum mine was looking for a place to put its tailings pit, they were going to put it in the saddle on Guadalupe Mountain, to the south of us. They put red dye in their test well, and two days later it came out in the river. They decided that maybe that wasn't a good place to put their tailings pit after all--so there are good reasons to look at water depth and water flow.

Another area of research right now is heat flow and geothermal gradients. Waters are markedly warmer to the west—at Tony's ranch it is consistently 20 degrees C. There is also a concentration of warm water along the Taos Plateau horst, and which runs under the fish hatchery. Sherrie Kelly, who is also involved with the water aspects of the Mancos-Gallup shale development is also the "Apatite Fission-Track Queen." When they measure the fission tracks of radioactive materials in apatite minerals, it tells them the date of the uplift of the mountains and the erosion rate, so they can tell that 10 MYA the Sangre de Christo Mountains uplifted.

Third Stop: Bear Crossing

The upper, middle and lower layers of the Servilleta basalt are evident here. The blocks along the edge of the Gorge are terranal blocks that are breaking off and sliding down into it. Looking across the Gorge, an uplifted horst block is visible—these are older lava flows that stick up in the middle of the rift—the deeper parts of the rift are on either side, and the shallow part is in the middle.

The dacites in this area were extensively used by Native American groups—the whole area is basically a site, and there have been a lot of finds in this area, dating from Paleoindian times to Spanish contact.

Behind the hill across the gorge is a perlite mine. Perlite has a high silica content, and when the water in it vaporizes it expands, and makes the resulting material very light. Most people are familiar with it from potting soil mixes.

Fourth Stop: Geologist's Overlook

Again you can see the upper middle, and lower Servilleta basalt, but on top the upper layer you can see dacite lenses that are about a quarter of a mile wide about 100 feet thick. This is a fine-grained dacite—if you drive on the other side, you drive over 10,000 colloidal fractures of dacite that are the source of 95% of the projectile points found in Taos County. There are also a number of quarries located there. The points can be dated by their changing shapes, and Tony

finds points from all time periods on his ranch. As you drive along the West Rim, there are 10 million points—all they had to do was pick it up and refine the shape.

The trees around are almost all *Juniperus monosperma*, one-seed juniper. There are a few piñons…it doesn't look like there are too many that were lost to the piñon bark beetle. John concurred that they had only lost about 10%. Tony said that at his ranch, they had lost nearly 90% about ten years ago. There are a lot of fires that are visible in this area—the Montoso fire over the hill, the Lama Fire, and the burn three years ago on the north edge of Tony's land, the Double D Fire. There were three others last year. People continue to build houses along the east side of Taos, but that area will burn eventually unless they thin. That is a large part of the effort of Firewise in this area, in which Martha Brown is actively involved—she was the first in El Salto. People are looking at thinning trees, taking out brush, etc. The county chips all the slash they take out. They are cleaning up some of these communities so they won't burn. If there were a lightning strike, with all the dead trees, it could be bad…and the juniper, when it burns, is explosive. It isn't a question of if Taos is going to burn, it's when. They need to start thinning the piñon and juniper on the east side of the mountains—you can't walk through the canopy. If you can't walk through it, and you look down, the ground is bare. This area, too, has a fairly thick canopy—they probably need to look at thinning the whole Monument. This is a big job.

There is a series of layered volcanoes here…the Visitor's Center is actually build on top of the Red River volcano, though it doesn't look like it. There are younger dacite volcanoes that overlie the older olivine-andesite volcano. Cebolla Mesa, which you can see, is about a 3 million-year-old alluvial fan—the headwaters for the Red River used to be at Flag Mountain. There is a whole complex of alluvial fans that the Servilleta basalts lap on to. Three million years ago, the topography looked very different.

Sam pointed out that they were looking at the former headwaters of the Rio Grande—the Red River—before the drainage of Lake Alamosa cut the Gorge.

He pointed out that on the way in, we had passed some areas that were devoid of sagebrush or the sagebrush was lower. That is due to their efforts to improve habitat for mule deer. They have disked the sage, and reseeded with grasses and forbs. There is a lot of cover there, and they are bringing in water, but a lot of the food that the young does need in the spring was missing, so that is what they are trying to bring back. There has been a lot of discussion in the office—in some of these areas they are going to try to narrow them and build more edge, and include islands of sagebrush. They have tried various techniques—one is sagebrush blading. They use a bulldozer during the winter, after the ground has frozen and there's a layer of snow, and you can run the blade on a float, and it snaps the sagebrush off right at the soil surface, so you don't churn up the soil, you just take the sage off. The problem with this is that it is almost like a prescribed burn—the conditions have to be right, and they haven't been getting those conditions. They have tried disking and seeding as a substitute. The reason that they have been limited to mechanical treatments is that the residents of Taos County hate herbicides. The most recent herbicide treatments were from 1985 and '86, 300-400 acre projects. Those were the last large-scale treatments that BLM did in Taos County. They are still using herbicides in their riparian areas, but they are small, to treat salt cedar and Russian olive, and no more than

five acres in a year. They are working in southwest willow flycatcher habitat, and as part of their negotiations with the Fish and Wildlife Service, these treatments are small—that's why it's five acres or less per year.

Myke asked about the "salt cedar eater" beetle. Sam said that it had been identified in the lower part of the Gorge, and it is only a matter of time –perhaps weeks--before it gets to the Orilla Verde area where they are doing the treatments. It is at the Velarde Dam. John added that they suspect that some of the residents have already taken branches from Velarde up to their properties in Pilar to "expedite" the spread.

Tony remarked that getting rid of the salt cedar is a complex problem—once you're rid of it, it leaves bare ground, and what comes in may be worse. Myke suggested that eliminating the salt cedar and Russian olive might solve the problem of them drawing the water tables down. Tony said that recent research has suggested that cottonwoods take up just as much water. Myke agreed that they do. Tony said that on the Pecos River they've tried to eliminate the salt cedar, and he has asked how much water they have saved, to be able to send to Texas, but they are unable to provide an answer. Myke concurred that it was hard to measure, especially when one is considering alluvial flow, rather than surface water. Tony observed that the good thing about the native cottonwoods and willows was that they don't put the saline solution back in the ground that the tamarisk does. Where willows and cottonwoods have grown and been cut, you may be able to grow grass, but this is not true of salt cedar, due to the salt from the leaves.

Fifth Stop: Visitor's Center

Merrill Dicks, Taos Field Office archaeologist, told the group that the cultural resources within the Monument are so rich that he could talk about them all day. There is a record of at least 10,000, and possibly more like 15,000 years of human use of the landscape. To give a sense of scale, based on the current data—which may not give an accurate picture—and tried to guess how many archaeological sites there are in the Monument, the figure would be around 78,000. That may be an underestimate, but there's still an awful lot out there. If you look north, that's where most of the Monument acreage is, but you really don't see many modern developments, or they are hard to spot. That's pretty typical of the monument—there are very few permanent residences out there—it's used for hunting, gathering piñon, recreation, and woodcutting, but there isn't much of a human presence out there today. That's amazing, because if you look at the archaeological record, there are millions and millions of artifacts and thousands of archaeological sites. He'd like to narrow it down to one particular site further down in the southern part of the monument, down in the Gorge. It is called the Vista Verde site, and there is a nice recreational trail that runs through that part of the Monument. Unfortunately, the group won't get a chance to get there today, but if you get the opportunity, it is a beautiful trail.

This site is unique because it is the first recognized archaeological manifestation of a culture that is not indigenous to the Rio Grande valley, called the Plains Horse Culture. These are ethnic groups that came in from the Great Plains late in the history of this region and were here

for about 150-200 years. We knew that they were here, because in the early Spanish accounts they were mentioned quite a bit, but they had never recognized any evidence of these people on the ground.

A few years ago, a group from Columbia University was working down in the Gorge, and saw something that those who had worked in this area for a long time had literally been walking by for the past fifty years. This group of students and their professor noticed that the very faint scratches on the basalt boulders were images. (He showed illustrations that some of the Columbia students had done). These images are scratched—most petroglyphs in this region are pecked, because basalt is a really hard rock, and if you try to scratch it, you aren't going to get a really visible image.

These images are very typical of what is called the Plains Narrative Tradition. It is a collection of motifs that have been recognized out in the Great Plains for years, but they hadn't been seen here—because they'd been walking past them. The images are hard to see, especially if the light is not right. The images include tipis and parfleches (leather bags that were common among Plains groups). They have been told by Comanche people, who they think are the particular group that may have created this particular site, that some of the designs are clan symbols, so they may be able to track some specific clans back to this site.

Of course, the horse was not indigenous to this part of the world—it was reintroduced by the Spanish. Wild horses got out into the Great Plains fairly early on, and thrived in that environment. Nomadic hunters and gatherers out in the Great Plains very quickly adapted to the horse. They made it their own. It caused an evolution in their society that happened very, very rapidly. Groups like the Comanche acquired the horse in about 1620, and by 1640-1650, their entire society was completely transformed. It made them incredibly mobile, it increased their hunting efficiency, and increased the distances that they could traverse in a very short period of time. You can carry a lot more on a horse. Both the populations of horses, and of these Plains groups, expanded very, very rapidly. Their realm of activity expanded, as well, so that by about 1700, they have the first concrete recognition of these groups in the Taos area. They came for various reasons…it was a very dynamic culture. They were typically trading, but they might be trading in the morning and raiding in the afternoon. They were very different from the agricultural communities that were in this area—the Pueblos and the Spanish. These were nomadic hunters and gatherers, but they saw this as an opportunity to come into this environment, that offered different opportunities and resources that weren't available in their home environment.

Horses are very common images in the petroglyphs and there are riders with headdresses—sometimes carrying lances or bows and arrows or shields. One image was originally interpreted by the Columbia group as a horse head and a shield, but subsequently some elders from the Comanche Nation looked at it, and they said that it is a dance wikiup, associated with the Bear Dance, which is a traditional Comanche dance. The fringe-looking designs around the parfleches—they could be horse hair, but they could also be human hair. There are lots of examples in museums where these were scalps.

All of these images are clustered around a village. The Columbia researchers identified a number of tipi rings. They have started to see sites like this everywhere, now that they know to look for them. He wonders how many such sites he may have missed over the years—they seem to be everywhere.

There is a very demonstrable presence of these Plains groups in this area, and they had a demonstrable effect on the inhabitants of the valley. Taos has always been a notable point on the landscape as a trading center—it is the furthest north of all the Pueblo communities. Taos was important during the fur trapping period, but it was a trading center long before that. Various groups would come to Taos to trade things like buffalo robes, dried bison meat and guns. Guns were being funneled into the Great Plains, primarily from the east, by the French and the British prior to the American Revolution. The Comanche served as go-betweens for things like guns, metal cooking vessels and metal arrowheads that they weren't getting from the Spanish communities.

The slave trade became very important. It's not talked about a lot, but it was a pretty profound part of the economy. There was a lot of raiding going on, and captives being traded between groups, and this was a major commodity.

The recognition of this was important, because we've known all along that these people were here, but now we have archaeological evidence of it. This isn't the only site like this out in the Monument—there are lots of other sites.

From about 1700 to about 1780s the Comanches were raiding the upper Rio Grande Valley very heavily, and contributed significantly to the destabilization of the Spanish colonial system here. By 1780, the Spanish officials in Taos had created their own political agreements with the Comanche, whereby they quit raiding Taos, but they were raiding right down the road at Abiquiu, Ojo, Santa Fe, Albuquerque and Pecos. There was a special fringe agreement in this area that was independent of the official Spanish colonial government. They were turning a blind eye to what the Comanche were doing, and even feeding them information about what the colonial government in Santa Fe was planning to do to deal with the Comanche threat.

Sam added that even today, there is a local dance that is held around New Year's Day, where local Hispanics do a Comanche Dance. They go around to different houses in communities around the Ranchos area, in commemoration of those relationships. There was probably a lot of intermixing. Merrill agreed that there was…the Comanches, in order to facilitate exchanges, would refer to someone as their "brother" or their "sister" to create a sort of either real, or fictitious kinship relationship. That's a mistake that the US territorial government made when they came in about 1848, they would always talk about the "Great White Father" being this benevolent entity in this far-away place. Well, if you refer to someone as your brother or sister, you are talking about some kind of an equal—you're on the same level. But when you talk about being somebody's father, it's a condescending approach. A lot of these Plains groups caught on to that, and were offended by it. It helped to set the stage for what happened out on the Great Plains and in this area with these nomadic groups during the US territorial period. It didn't really go so well. Little things like that tend to matter when cultures come together. There's a disconnect. Some of the open-eyed Spanish governors, late in the 18th century, clued

in to this, and they would talk about being brothers, but the US government didn't catch on to that.

There are a lot of unique resources like this out in the Monument. It's a huge area, and 10-15,000 years is a huge thing in terms of human history—it's nothing in terms of geologic time—so you can imagine that a lot of human history has been played out on this landscape.

When people talk about Taos, the first thing that pops into people's minds is Taos Pueblo. You may also think about the Spanish haciendas and settlements—of course those are really important components of the story of this region—but it has a much longer, much more diverse history to it. There were lots of different ethnic groups, lots of different cultures, and the dynamic interactions between these groups probably had a major effect on how things played out. It was not just the natural environment—although that was a significant impact on how cultures developed in this area—but also how people interacted with each other that was part of it.

Sam recalled that in the meeting the previous day, there had been a discussion of how dynamic vegetation communities are. They discussed how what they have today isn't what they had yesterday, and probably won't be what they have tomorrow.

The BLM works with a lot of people down near Pilar, actively restoring the riparian area—removing non-native exotics that have moved into those riparian areas. He works with a lot of folks that have the perceptions of what the reality is down there—that this gorgeous riparian area has always been that way. They get really concerned when the BLM goes in and opens an area for boat launching, or put in a trail for fishermen. Sam tells them that that isn't the case, even within his lifetime. He showed a photo taken in 1965 at the gauging station in the lower Rio Grande south of Taos. His father's vehicle was parked on a virtually empty streamside. He showed another of the same area, taken in 2008, with the area filled with willows and other streamside growth. An excellent illustration that what we have today is not what you had yesterday, and it may not be what you have tomorrow, so it really depends on what your goals are and what you're managing for.

Sam expressed that this is why he is proud to work for the BLM—they have done this work. Consider the change that you see between these two photos—what happened to the willow flycatcher between the older photo and the new?

This is an important point as they work with some of the public, to understand that things are constantly changing, and it is dependent on how we plan. That is how we set in motion the visions that we have.

<u>Sixth Stop: Gorge Bridge</u>

John Bailey pointed out some of the challenges of managing the tourism at the Gorge Bridge. The Highway Department has created a large rest area, but they have also created a dangerous

situation—there is no easy access from the rest area to the bridge itself. There have been at least two broken legs this year that he is aware of.

The Highway Department operates the rest area under a ROW lease from the BLM. They are working to develop sidewalks down to the bridge, at which point they will put in barriers so that no one can walk along the road. That then creates an issue with the bridge vendors. They are probably at least a year or two away from that taking place.

John said that the vendors could not be permitted by the BLM, because it is still a ROW leased to the highway department. The plan is that a small part of the ROW will be relinquished and become strictly BLM land again, and then the BLM would permit the vendors on about a five-acre area. He doesn't want to put that arrangement into action until the infrastructure is in place…otherwise people will be walking across BLM land and likely have their falls there. The liability here is significant.

Gary pointed out that, in that case, the Highway Department was not in conformance with the conditions of approval of their ROW. Sam agreed that they were not. John said that the Highway Department eliminated vending permits about 20 years ago. The vendors are there only because the County Commissioners said that they wanted bridge vending to occur—they wanted members of their community to have that option to make a living—for a number of vendors, this is their sole source of income. The County Commissioners came out very strongly in their favor.

He and Sam attended a number of meetings with the Highway Department, and created the proposal that part of the ROW be relinquished, and then the BLM would permit the vendors in that specific area, only. They are still waiting for the improvements to be completed, which would be paid for by the state and the county.

John said that he will be appearing before the Taos entrepreneurial network next month, and one of the things that he wanted to bring to their attention that this is the most visited part of the monument—a quarter of a million people come here every year. There is not a single sign there about the BLM, the Wild and Scenic River, about the Monument. They need to capitalize on the fact that so many people are there. He feels that it is important to the county, and even the town, that it be done right. He wants to put forth the idea that they need more than just a college intern working for the Highway Department to come up with a master plan. He feels that it needs to be a community-driven effort that meets a lot of different needs.

Gary commented that there was no interpretive information. He had gone out to the Bridge the night before, and there is a sign at the other end that talks about the highway and the state park, and he thought, "OK, whose is this?"

John said that the State of New Mexico had become exasperated with BLM's inaction in protecting the Rio Grande corridor, so they made it a state park, but they really only managed about 2500 acres—what the BLM now calls Orilla Verde. They took it back from the state in 1989, and the lands were formally transferred back to the BLM in 1990. At that point they

trusted that the BLM was taking it seriously, and bowed out, but some of John's staff still refer to it as the "state park"…he's still trying to get that straightened out.

This area is essentially a work in progress, though he feels that the Highway Department had done a nice job in refurbishing the rest area. The local astronomy group feels that they went a bit overboard in their lighting—you can see the rest area from 20 miles away. They have had scoping comments that they should consider becoming a "dark sky" monument, but even those who are proposing it feel that there is too much light pollution from Taos already. He said that there is a lesser designation that they may try to achieve.

Their goal is to begin to develop an interpretive plan for the area on their own, and then mesh it with what the Highway Department is doing. A lot of people like to go there and park, and take the Western Trail, which goes 10 miles along the rim down to the Orilla Verde area. There are a couple of benches a mile and a half out, so that stretch is very popular. There are a lot of weddings there. People like to walk out along the trail and take pictures back toward the bridge. They'd like to have a closer walking trail—perhaps paved—that provides that opportunity. There are probably 3-4 million pictures taken per year of that facility.

Gary asked how old the bridge was. Tony said that it was built in 1964, and John added that it won awards for its design the year after it was built. Before that, the only way to cross was at John Dunn Bridge, on old Highway 111.

John said that the Rio Grande corridor into two zones—the Upper Gorge begins at Taos Junction Bridge. That bridge, and this bridge, the John Dunn Bridge, and the Lobato's Bridge up in Colorado are the only four places that the river can be crossed in the entire Upper Gorge stretch. The Lower Gorge is much shorter, and it has pavement with about 200 yards of the river its entire length. It's all about access. The Lower Gorge is the busiest part of the monument—there are a lot of campgrounds, and they are almost always full in the summer. At the Upper Gorge, at Wild Rivers, they are crying for more people to visit. People perceive that it is difficult to access—an hour drive from Taos—but one of the joys of that area is that they have so many trails, and so many trailheads, and so many different directions to go and places to park that you can have a lot of people there, and they don't even know other folks are around. That's what people love about it. He thinks they could double the amount of use, and it wouldn't affect the quality of the experience at all.

The Wild and Scenic designation begins at the Colorado state line, and initially went down to the Taos Junction Bridge—that was in 1968 when the Wild and Scenic Act was enacted. In 1994 Congress designated the section from Taos Junction Bridge down to County Line Recreation Site as a Wild and Scenic River, and further designated from County Line to Velarde as a study segment. As a consequence, almost the entire Rio Grande Gorge is under significant protection. Even the Colorado portion—the Gorge really begins at Lobato's Bridge—those first twenty miles are designated as a The Rio Grande Natural Area. (Colorado has essentially sworn that it will never have a Wild and Scenic River in the state—they aren't interested in anything that might interfere with their water rights.) So there is some protection, but it is silent about water quality or quantity.

Gary asked if most of the BLM portion was designated as “wild” or “scenic,” etc. John said that most of the river from their portion is designated as :”wild,” the stretch from Taos Junction to the County Line is “scenic,” and the current study segment is managed as recreational. When you have a Wild and Scenic River, you have to classify it as “wild,” which is factors such as wilderness, “scenic,” or “recreational.” “Recreational” doesn’t mean that it has more recreation opportunities—it was a poor choice of words by Congress—it means that there is so much private land and so much development that they needed another designation. It’s not that “scenic,” necessarily, and definitely not “wild.” The “scenic” section where it should have been designated as “recreational,” because it has facilities, pavement, power lines, etc., but the residents down there said that if it were designated as “recreational,” they felt that they would be overrun with boaters, to which they objected. But in a “scenic” designation, a lot of those houses could not be built. So it is really managed as “recreational,” but they call it “scenic.”

Sam commented that there is a dark side to the BLM’s management of the Monument—the High Bridge sees several suicides each year. Their Law Enforcement folks constantly respond to calls about people slipping off the rim. John said that in just the last month they had had three suicides and one accident. Tony noted that it was very difficult and dangerous to retrieve the bodies—it’s a hard climb down. Dave said that they would be having discussions with the county the next day, regarding the high cost involved. The State Police have the Search and Rescue responsibilities, and the county is a participant in that. Although the BLM provides law enforcement, they don’t provide financial assistance for the challenges.

Tony explained that the geology is exposed here for about 700 feet down to the bottom of the Gorge. It is all Servilleta basalt. There are a couple of silty zones in between, so you have an upper, middle, and lower layer of the basalt. They all look alike. If you look at the buildings there at the rest area, you can see fresh pieces of Servilleta basalt with the big crystals in it. There are a couple of interesting geologic structural features in the area. The first is the “Gorge Arch,” which in the trip log is called the “Airport Arch.” The airport runway runs along the arch, because it is the only place where there aren’t a lot of valleys. The valleys we drove through on the way here are cuestas—dipping tertiary gravels caused by the uplift of the arch. That arch is probably still being uplifted. When they were training the astronauts in space, he had them look at this, so that they could see what an uplifted structure looked like. As you go east from here towards Taos, you cross several faults—one of which runs through the landfill. The faults do interfere with the water table flow.

At the rest area, you are standing on the edge of the east dip of the Rio Grande Rift. This side is actually a little higher than the other—the bridge was placed in an erosional depression in the rim, so that they could make it flat. The other side is about 50 to 100 feet lower, and there is a fault that actually runs under the bridge. He did not know when it moved last, but suggested that one proceed over the bridge fairly quickly. The river follows the fault for a little ways.

West of the Gorge on Highway 64, Tres Piedras is a series of volcanoes that you will drive by. The aquifer here is generally below the basalt. West of the Gorge, although in the Monument the water is only 200 feet deep, as you go further west the water table is 500 to 1000 feet deep. The drillers don’t like to drill in this area, because they have to drill through a layer of

unconsolidated sand, which grabs the drill bit. The deep wells flow at about a gallon a minute. There are 100 wells west of the Gorge, and 10,000 east of the Gorge.

Looking toward Tres Orejas, a dacite volcano--the three peaks on top are actually dikes—the vent is on this side where the cinders are. Cerros de Taos has two vents.

Last Stop: Wolf Springs Ranch

The group stopped at the entrance to Tony's 2,000 acre ranch. He introduced David Montoya, his ranch manager, who met us at the site. The volcano is Cerros de Taos, which is an andesite volcano—pieces of andesite could be seen at the front gate, outcropping next to the basalt.

Tony brought the group here to discuss range management. He has 24 pastures that were set up to do rotational grazing for conservation restoration—they leave all the gates open now. He has 200 animals, and they rotate by themselves. A clear delineation can be seen between the area outside the gate, which is thick with sagebrush, and that inside the fence, where there is much more grass. This is an "exclosure." Due to the fence along the highway right of way, grazing has been excluded since 1964. The bare ground along the ROW can be seen, there is a lot of canopy—this is what happens when the land has not been grazed or mown for 50 years.

He has worked with the NRCS for the past twenty years, and they do yearly field trips to the site. With the exception of Linus, this is the first time that Tony has been able to get the BLM out to look at it.

They experimented with rotational intense grazing, based on work done on the Serengeti Plains. It rains less than 4" per year here, so trying to restore range is difficult. Last fall, however, they had 24". There was also a little rain last winter. This is the greenest it has ever been. Across the street at the Double D, where a fault has pulled apart and dropped down and filled with sediment, they grazed it and grew alfalfa and irrigated it—as a result, it drew the wells down about 100 feet. If you have noticed all the dust in Taos—it is coming from over at the Double D.

Tony is part of the NRCS Conservation Stewardship Program. This is an ecological service payment that is made to ranchers around the country to continue conservation practices. Tony's contribution is that he has 24 monitoring stations. They run transects and measure litter, forbs, shrubs, grass, etc. The only transect with a failing grade of 42 is the section outside the fence, along the highway that hasn't been grazed in 50 years. There is the occasional patch of Indian rice grass because of the fall and winter precipitation last year. The range health score elsewhere is 66. Range health is scored based on a volume co-authored by the NRCS and the BLM, with 17 attributes, which are measured each fall. Even a score of 66 is barely passing…it has gone down the last few years because of the drought. It should look better this fall, with all the rain last year.

The major range health concern in this area is how to reduce the amount of bare ground. Inside the fence you can see crested wheat that was planted in the '60s. It has been grazed and

occasionally mown. The adjacent pasture has more sagebrush—it is too rocky to mow—but they have grazed it. When they dig up the sagebrush, the roots go down about 4", and then extend out laterally about 4 feet. He's not sure if that is due to a hardpan, or lack of moisture. Those roots steal all the moisture from whatever grass was left. It has crossed a threshold, as was discussed earlier—you either have to mow it or graze it or blade it, or disk it and seed it. If they see seeds under the sage, they mow it.

Twenty years ago, the program for getting rid of sagebrush was to disk and reseed. Now they have found that mowing is effective—he has a 100 acre patch up in the saddle that they mowed, and they have 100% kill of the sagebrush. It has never come back. Elsewhere, like at Wild Rivers, the sagebrush does come back. You have to adapt to local conditions…the NRCS standard is to disk it three times. With the loess soil in this area, if you disk three times, you wind up with soil like talcum powder three feet deep. If you try to plant grass in that—it had better be raining whilst you do it. Loess silt has no vertical stability—when it rains, it forms ravines. Tony has dammed up the depression from the old stagecoach road from the John Dunn Bridge to the Servilleta train station. Every arroyo—all one hundred—on his property were dammed up, but they found that eventually you are going to have a flood big enough to breach them. A 3" rain wiped out 18 dams, and flowed out on to the road.

There is work being done now with "one rock" dams. You put down one layer of rock, and slow the water down, the sediment drops out, and eventually it fills in. If you build any kind of a larger dam, eventually it is going to breach. He now has 100 or 200 "one-rock" dams.

About a mile back down the road, they seeded a mixture, and most of what came up was Russian wild rye, which germinated with only 2" of precipitation that year. The first year it grew five feet high. Now it is about two feet high. It is very salicious—they like the leaves and the blades, but the stems are a little iffy. Crested wheat was planted 50 years ago—now people are planting sagebrush to try to get rid of crested wheat.

They teach the students in college that we need to plant sagebrush, so that there is sage grouse habitat. Perhaps an idea for the monument would be to repatriate the sage grouse—there's no lack of sagebrush. A lot of the research done by academics on rangeland management is done on ten-foot plots, and they have "proved" that rotational grazing is bad. But when you see the results of rotational grazing on a larger scale, it is clear that it works.

A lot of the conclusions that he's reached apply to management of the Monument, too…in 1890-1940 the area was overgrazed—there were 5 million sheep. They killed most of the grass, but they also kept the sagebrush under control. After the Second World War, the sheep disappeared, and the sagebrush took over. If you count the growth rings on the sagebrush, you can see that it's 50-60 years old, if the rings are accurate. So it is under grazing over the last 50 years that has caused the problem, not overgrazing. The sagebrush and the PJ have invaded. They do sagebrush thinning, and the piñon bark beetle killed 90% of the piñon. The juniper remained. Around the corner you'll see the Double D fire—it burned 500 acres in two hours. They called in the bombers and put it out…they probably could have let it burn another 15 minutes.

The stories that you heard in the local papers about that fire were wrong—he met every day with the fire chiefs and Pat Pacheco (Taos Field Office). A few days later they started the fire up again, trying to burn the sagebrush going the other way. Fire does get rid of sagebrush, but especially in the Taos environment, it's pretty dangerous. The alternatives are grazing, fire, herbicide—used down south—and mowing. Mowing is hard on the equipment. They have gone to 15-foot flail that beats the sagebrush to death. If you use a rotary motor, the larger sagebrush can knock the gears out of it. Disking and reseeding is expensive, and it's an open question whether what you have planted will germinate, so they are getting away from that, and trying to do mowing. They are removing 60 acres a year of piñon under NRCS aegis. There were three lightning strikes on his land last year. Trying to build roads and fire breaks is hard. Twenty years ago, when he acquired the property, you couldn't walk through the canopy of PJ, with bare ground underneath.

Another conclusion that Tony has reached is that most of the erosion problem in the area is not a result of water, but of wind. There is a little soil erosion in the spring when the snow melts and the soil is still frozen, but the wind is responsible for most of it. You can see that a lot of the grasses are pedestaled…for some of them, the roots are sticking two inches above the ground…they lost two inches of soil last spring. There is no topsoil here…it has been blown away.

He believes that the answer to the dust problem is winter annuals—last year they planted 80 acres of winter wheat and winter rye, mixed with some perennial seeds, and the grass has been all winter and the dust isn't blowing off of his land. Areas around town used to grow alfalfa, and then they stopped irrigating. There have been complaints in the paper recently because a subdivision is built next to an old alfalfa field that is now 100 acres of dust. It is a lot of work to plant the winter annuals, but they are fairly inexpensive compared to native seeds.

Sam asked if they had any elk tags issued on their land. He said that there were 14 elk tags. They like having the elk. Elk prefer grass to sagebrush. In areas where they don't run hunts, they get deprivation killings. Tony runs hunts, it is profitable. He would like to see more aggressive restoration on the monument, the winter elk herd of 5000 head might stay there year-round. He has a permanent herd of 20-40 animals—they provide water and salt. Two years ago they had 500 head there for the winter.

Tony pointed out ring muhly, a low-growing native grass. Merrill asked if there were any "intact" (undisturbed) soils on his land. Tony said that he had some in the low valleys, and that they continue to fill in every year.

An article a couple of years ago in the Society of Range Management publication talkeda bout training cattle to eat shrubs—they are actually higher in protein and nutrients than crested wheat grass. The problem is getting cattle to eat woody plants. They brought in 600 goats for a week to see if they liked sagebrush. They wound up having to feed them alfalfa—they got tired of sagebrush.

You can see a lot of winterfat further up the slope. They have seen a lot of chenopods come in the last few years—they are seeing four-wing saltbush, as well as the annual weeds in the

summer—tumbleweed, purslane, goosefoot. Now they are planting annuals in the winter—they provide some soil cover and put some carbon back into the soil.

These are the kinds of ecological services that the NRCS is paying them to provide. In the discussion yesterday, there was discussion of non-market values. These kinds of ecological services tie into that.

Myke asked if Tony was familiar with the work that was done on reclaiming old open pit mines. Tony said that there was a "poop and stomp" that they use on old mine tailings. Myke said that he was referring to different techniques, dealing more with morphology, like Tony's discussion of his dams. They experimented with that on the La Plata mine, and were very successful with the reclamation. Sam said that they have done work on the use of nematodes as an indicator of reclamation success. Tony remarked that that was why he liked to bring the BLM folks out to see the kinds of work that is being done, because the BLM doesn't really have any range experts in this area anymore. Myke said that he would send Tony the name of his contact for restoration. Tony said that when he was on the State RAC, they did a lot regarding the reclamation of coal mines in the Farmington area and seed mixtures.

Seed mixture recommendations change. The Russian rye has been phenomenal on Tony's land. They also have a lot of sand drop seed, a summer bunch grass, but they really want some rhizomatous grasses. That's the advantage of western wheat grass—it covers all the ground. Muhlenbergia does the same thing. Even sagebrush slows down the wind. They could plant fourwing saltbush, winterfat (which requires a special drill). All of the winterfat on his ranch has come in naturally—when they thin the piñon, the winterfat comes in by itself. Most of this is in the seedbank, under the PJ or under the sage. You don't have to do a lot of disking and reseeding. Because of the recent drought conditions, he has had to germinate some of the pastures three or four times.

Sam made reference back to the question of vision. The BLM has recently acquired some land down toward Santa Fe, and they would like to get into growing native seed for local use. They have an intern coming next week. It is a three-year program—the land is irrigated. Dave discussed Seeds for Success, which the BLM uses to collect local seed for re-use on BLM lands. Tony agreed that native seeds are hard to come by, and are expensive. Dave acknowledged that the BLM's demand drives that market, and increases the prices, especially for fire restoration. Sam said that they would like to develop a local source.

Dave extended thanks to Tony for preparing and leading the tour.

The tour disbanded at approximately 3:45 pm.