Enclosure to July 13, 2009 letter to John DeJoia—Review and Comments on Sampling and Analysis Plan, RHR, LLC, Roca Honda Mine, Permit No. MK025RN

Pursuant to NMAC 19.10.6.602 (12) MMD has reviewed the Roca Honda Resource April 2009 Sample and Analysis Plan (SAP) in preparation for their permit underground uranium mine application to be located in McKinley County. Review comments are presented in tabular form and are given below.

	General		
Section/Page		**Topic**	**Comment**
	General	Maps	1. There are no contour line elevations on the provided maps. Please put elevations on contour line intervals. 2. Please put elevations on plateaus, peaks, wells, and proposed discharge points.
	General	Shape Files	Please provide shape files (GIS/GPS coordinates in UTM coordinates, NAD 83, Zone 13) for all 'features, wells, arch sites, proposed mine foot print and lay-out, exploration boreholes, etc.

Section 2 Meteorology and Air Quality

Section 2 Meteorology and Air Quality		
Section/Page	**Topic**	**Comment**
General	Other Meteorological Data	Baseline meteorological data should include historical meterologial data collected for more than a one year from stations within the vicinity of the permit area. Data collected should have assurance that the instrumentation and data recorder meet the criteria of either NOAA or WRCC guidelines.
Sections 2.4.2 and 2.4.3	Radon Detectors	The collection and methodology for radiation data described in Sections 2.4.2 and 2.4.3 need to be moved to Section 10.
Section 2.1	Precipitation	It needs to be stated that the meteorological data collected will include average daily and annual daily precipitation, standard deviations, highs, lows, and years and times when these measurements were or will be taken. This provides a background as to time-frame of (and expected and outlier values) for extremes, highs, lows, and daily and seasonal averages. Also, seasonal averages and extremes within the vicinity should be obtained via NOAA and WRCC data sets to corroborate local meteorological data and assess differences between local and regional data. NOAA data may be downloaded at the following site http://www.weather.gov/climate/xmacis.php?wfo=abq WRRC data may be downloaded at the following site http://www.wrcc.dri.edu/
Section 2.1	Pan Evaporation values needed	In order to get an estimate of expected evaporation in the Roca Honda area, the parameter used should be 'pan evaporation'. Pan evaporation integrates evaporation affected by temperature, humidity, solar radiation (which can be affected by air particulates), and wind. For the southwest there are months when pan evaporation is very high, accounting for most of the annual pan evaporation. If there are no pan evaporation measurements within the vicinity of the proposed site, then a 'Class A' pan evaporation needs to be installed as part of your suite of meteorological station instruments. Because pan evaporation rates are actually generally higher than what is achieved in natural evaporative environments, standard practice is to use between 50% and 70% of the pan evaporation rate for design of retention facilities. Additionally, what is needed is to apply reference evaporation rates based on geographic similarities.
Section 2.1	Wind-speed	Background information for wind-speed information should be cited.

Section 2 Meteorology and Air Quality

Section/Page	Topic	Comment
		The wind-speed data to be collected needs to provide the high, low, average daily values and principle directions. This provides a background as to time-of-day and season when expected and directional extremes will occur.
Section 2.1	Air quality	In the background information please provide what is meant by EPA's classification of the area as an 'attainment' area.
Section 2.2	Sampling Objectives	1. In the meteorological section the obvious sampling objective is to collect relevant and accurate baseline meteorological data, temperature, precipitation, wind-speed, RH, etc. . This is not stated in the sampling objective; please include these parameters in your sampling objectives. 2. Background radiological conditions - The radiological discussion and sampling protocols need to be moved to Section 10, *Radiological Survey Plan.*
Section 2.3	'Data needs'	In the first sentence you cite, *'data needs were identified for meteorology data (Baseline Data Summary, Section 2.0, and "Climatology")*'. There is no such section in this report. Please correct.
Section 2.4	Methods of Collection	As stated in EPA 2000 (see references at the end of this section), the user should acquire enough meteorological data and at discrete time intervals to ensure worst-case meteorological conditions are adequately represented. It is these worse case scenarios that can cause maximal impacts on topography, vegetation, and air quality. Meteorological stations should be set-up meeting NOAA's SOP. Additionally, per standard NOAA data collection methodology, all meteorological data should be collected in 15-minute intervals.
Section 2.4	Air Quality Monitoring	The passage *'Data from the Gulf Mt. Taylor Environmental Report (1979-drafted for the proposed uranium mill) indicated ambient particulate matter in the San Mateo Valley above ambient standards. Radiological data results were not reported and the trace metals were below limits.'* needs a citable reference. This information needs to be included in Section 13.

Section 2 Meteorology and Air Quality

Section/Page	Topic	Comment
		.
Section 2.4	Air Quality Monitoring	The Hi-Vol sampler installation locations and calibration needs to be part of this SAP. Please include.
Section 2.4.1	Air Particle Pump	Suspended air particles data needs to be identified as one of the parameters to be collected in Table 2-1.
Section 2.4.3	Use of TLD and placement	**(Note, the Thermoluminescent Dosimeters (TLDs) information needs to needs to also be addressed in Section 10**
Section 2.4.2	Radon Detectors	**(Note, the information on radon TLD detectors needs to also be addressed in Section 10**
Sections 2.4.2 and 2.4.3	Radon Detectors	The text describing the installation of the alpha and gamma dosimeters needs to be put in a separate QA/QC procedural section. (Again, all of text on radiation needs to be moved to section 10.)
Section 2.8.1	Meteorological Station – Instrument ranges and sensitivities	There are no instrument specifications, operating ranges and sensitivities in this section. Please include.
Section 2.8.1	Meteorological Station - units	To be 'defensible' and consistent with other sanctioned weather station data, the meteorological data needs to be collected, verified, and monitored per NOAA sanctioned guidelines. Standardized SI units for recording data need to be specified as listed below.

Parameter		Short Name	Units Format
(1)	DateTimeStamp	DateTimeStamp	m/d/yyyy h:mm
(2)	Record	Record	
(3)	Average Air Temperature 00.0	ATemp	°C
(4)	Average Relative Humidity 000	RH	%
(5)	Average Barometric Pressure 0000	BP	mb
(6)	Average Wind Speed 00.0	WSpd	m/s
(7)	Average Wind Direction 000	Wdir	°
(8)	Maximum Wind Speed 00.0	MaxWspd	m/s
(9)	Maximum Wind Speed Time hh:mm	MaxWspdT	hh:mm

Section 2 Meteorology and Air Quality

Section/Page	Topic	Comment
		(10) Wind Direction Standard Deviation SDWDir sd 000 (11) Total Precipitation TotPrcp mm 00.0 (recorded in 15 minute intervals) (12) Average Battery Voltage AvgVolt volts 00.0 (13) Cumulative Precipitation (24 hour period) CumPrcp mm 00.0
Section 2.8.1	Meteorological Station – general	General – The plan needs to specifically state all the required QA/QC checks (item by item) are performed per the *Campbell Scientific* CR1000 standard operating procedures (SOP) for the Meteorological Monitoring Station.
Section 2.8.1	Meteorological Station – wind-speed	Measuring wind-speed –There should be assurance that common data collection errors are avoided. **It should be stated** that a weekly orientation check is performed to ensure the wind speed indicator is always pointing true north. Where is the anemometer located above the ground surface, 2-, 5-, or 10-m? The plan must specify the location.
Section 2.8.1	Meteorological Station –	Measuring Precipitation - There should be assurance that common data collection errors are avoided. **It should be stated that** the tipping bucket rain gauges are functioning properly. (These tend to jam up. Common problems arise due to roosting birds 'tampering' with the instrument causing it to clog, get stuck, or become off-balance.) A weekly check for these types of malfunctions needs to be specified in the SOP. RHR states they are using a Campbell Scientific meteorological station.
2.10	EPA references	The EPA 2007 references are not adequately identified. Please provide a full citation in the reference section.

References:

EPA, 2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications EPA-454/R-99-005.

Section 3 Topography

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Item #	**Section/Page**	**Topic**	**Comment**
	Figure 3-1	Contour elevations	Please put elevations on the contour lines.
	Figure 3-1	Observation well - labels	Please label observation wells on map and include elevations.
	Figure 3-1	Road labels	Please provide labeling of all paved and dirt roads.
	Figure 3-1	Projected mine operations and buildings	Data collection that should be associated with proposed building locations. Consequently, please provide a general lay-out of mine operations: buildings, ponds, vents, waste piles, burrow locations, mine discharge pipes, parking, and sidewalks etc., etc., such that this layout will minimally impact canyon and arroyo up-cutting gouges and erosion. Additionally, it should be mentioned that the footprint of the mine and mine operations, because of data collection, as describe in the SAP, will may be modified due to knowledge, inferences and conclusions that the data will provide.

Section 4 Vegetation

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Section/Page	**Topic**	**Comment**
Section 4.1	Introduction and Background	Copies of Wood 2006a & 2006b should be provided for our review.
Figures 4-1 thru 4-3	Maps	All maps need to show elevations and/or contour intervals.
4.3, pg. 4-3	List of Data to be Collected	Provide rationale for transect & exclosure locations and reference area chosen.
" "	" "	Discussion needed on pre-mining impacts from livestock grazing. (see 17. below)
Fig. 4-2	Vegetation Transect Line Locations and Enclosure Locations	Explain what the symbol "Pool" represents.
Fig. 4-3	Transect Line Locations and Enclosure Locations	Explain why no arroyo transects are proposed in the reference area.
Section 4.4.1.3	Invasive and Non- Native Species	Which list of noxious weeds will be used (e.g., NM Dept. of Ag.)?
Section 4.4.2	Vegetation Descriptions	Veg. cover, total grd. Cover, etc. will be documented for reference area, too?
Section 4.4.2.2	Data Collect…	What is the purpose of arroyo transects & how will they be taken?
" "	" "	Are all six veg. types found in the reference area?
" "	" "	For point-intercept method, 15 transects minimum are required (MMD Guidelines).
" "	" "	For belt transects, 15 transects minimum are required (MMD Guidelines).
" "	" "	Insert the word herbaceous in the following, "All herbaceous plant material".
Section 4.9	Brief Discussion Supporting Proposal	Explain how ocular estimates of relative abundance will mitigate shortcomings of point intercept
Section 4.10	References	Were NRCS rangeland conditions reviewed and considered?

Section 6 Topsoil

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Section/Page	**Topic**	**Comment**
Section 6	General	The term "topsoil" is usually restricted to A-horizons. In semi-arid climates good suitable materials may be salvaged from A+B+C and even some - materials. A better term for salvageable materials should be referred to as "suitable topdressing," "suitable soils" or similar. Not all materials identified as "high quality" will be salvageable. There may be good quality resources on slopes too steep to salvage or within areas to avoid. Calculations of salvage volumes should consider these limitations. RHR should also allow for some loss during handling/storage, and higher post-reclamation compaction, collectively estimated as 10-15% loss by many operators. MMD recommends that steep slopes be reclaimed with materials containing high proportions (up to 60%, depending on matrix texture) of gravel or rock. RHR should plan to identify and handle these materials separately. Depending upon the variability of soils in the mine design limits, soil quality and intensity of sampling in this effort, RHR may be required to do additional mapping and sampling before mine facilities are constructed. Saline and sodic soils may be acceptable for salvage, depending upon the degree of effect, texture, slope position and other factors at the time of reclamation.
Section 6.4	**Methods**	RHR can easily misjudge salvageable topsoil with inaccurate information, with expensive consequences. The lack of alignment between USFS and NRCS map units (Fig. 6-2) is disconcerting and should be resolved. A soil scientist with a good deal of experience in "local" soils should be used to characterize soil resources for RHR. Many characteristics such as salinity can be extremely difficult to determine in the field without a keen eye and a "feel" for appropriate laboratory sampling.
Section 6.4	**Composite sampling**	MMD will not accept composite sampling for soil character. Soils in the area transition from one type to another in ways that do not always equate to topographic or vegetation changes. An arbitrary number of samples should not be determined beforehand. Each common soil component (not unit!) should be sampled at least once within each unit and fully exposed by backhoe for a thorough view/characterization of the profile.

Section 6 Topsoil		
Section/Page	**Topic**	**Comment**
		The field soil scientist should have some leeway if field checks reveal more or less variability than is indicated in higher-order maps. Again, MMD stresses that an experienced soil mapper at the beginning can prevent expensive mistakes at the end of the salvage/storage/reclaim cycle.
Section 6.4	Depth-wise sampling	Soils in the area will have well defined strata that will not correspond with arbitrary sampling depth intervals such as 0"-6". RHR should NOT sample from specified depth intervals but attempt to define individual horizons at a sampling location and the depth of "breaks" or transition zones between them. By locating breaks, a more accurate salvage volume can be estimated for a particular area without mixing horizons of different character. See item 2 above: A soil scientist may randomly or (better) locate sampling points within chrono- or toposequences to better characterize an "average" and "deviation" of soils from existing maps for an area. Each location may be described by changes in texture, color, etc. from location to location, though sampling for laboratory tests from a single "representative" type-profile may suffice for an area of similar soil. Unless buried soils are encountered or expected, RHR should limit sampling to materials above Ck horizons that have >10% carbonates or any induration.
Table 6-3	Parameters	The field soil scientist should be prepared to and frequently perform analysis of soils for pH and electrical conductivity in order to "field-calibrate" for these important parameters and judge sampling needs. In addition to a hydrometer texture, please sieve for the break between medium, fine and very fine sands (#60 and #140 sieves). Sieve data should be proportioned to total sample mass (from hydrometer data). This will enable better RUSLE or SedCad modeling later. Rather than test for macro- and micronutrients RHR should instead test samples for soluble B, hot-water soluble Se, and total U, Ra (or gross alpha and beta in lieu of U, Ra). N-P-K testing may be helpful immediately before reclamation, tested from stockpiled materials, though N and P values will be reliably below any agronomic values. Please add inorganic carbon testing to the parameter suite. (to the nearest 0.1% $CaCO_3$ equiv.)

Section 6 Topsoil		
Section/Page	**Topic**	**Comment**
		Soil SAR (sodicity) data should include component parameters of paste Ca, Mg and Na in units of me/L

Section 7 Geology

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Section/Page	**Topic**	**Comment**
Section 7/ page 18	Geology	General comment: the thickness of the Dilco Coal is probably less than five feet thick.
Section 7/ Page 12	Geology	Include a set of the recent borehole logs from 2007 with the tops marked and target ore zones indicated as RHR interprets them.

Section 8 Surface Water

Section 8 Surface Water		
Section/Page	**Topic**	**Comment**
Sections , 8.1, 8.2, 8.3	General	The plan does a fairly good job of identifying the data gaps and subsequent data needs.
Sections. 8.1, 8.2, 8.3	General	The text needs to be clarified throughout by making more consistent and specific reference to laboratory analysis for WQCC water quality standards and constituents instead of "other water quality parameters". This is in addition to all the other parameters (cations/anions, volatiles, semi-volatiles) proposed.
Section 8.5.1.3	**Baseline Water Quality – *division of stream reaches***	The first sentence of Section 8.5.1.3 makes mention of "reaches will be characterized…," but nowhere is it explained how the reaches have been broken out or distinguished. The text should provide a better description of how the drainage system was segmented, and what reasoning was employed.
Section 8.5.1.3	**Baseline Water Quality – *sample populaton***	The document should explain how it was determined that a sample population seven samples would suffice? It seems a minimum sample size of at least 10 would be pursued in order to minimally define the variance within the sample population. It should

Section 8 Surface Water		
Section/Page	**Topic**	**Comment**
		be better described how the sample locations are determined, and what dictates the proposed number of samples. Describe sample collection in terms of measured field parameters and filtration (totals, dissolved). What is needed is a sample and analysis plan the defines protocols, i.e., the planned volume of the samples collected, will there be any field parameters taken (conductivity, EH, pH, etc.?) are you going to collect volatiles and semi-volatiles, filtered and unfiltered samples, size of filters, will samples be stored at a specific temperature.
Section 8.5.1.3	**Baseline Water Quality –** ***laboratory detection limits***	There should be some mention and/or description of the method detection limits that will be employed in the laboratory. The methods are all provided but not the respective detection limits.
Section 8.5.1.4	Sediment Constituents	This section needs a discussion on what particle size fraction will be collected for lab analysis. Document needs a discussion as to the sample types; surface point, transect composite, and/or point depth composite. How will samples be collected? What volume of sediment will be collected? How will the sample be prepared (sieving) in the field? Compositing? Split samples for QA/QC? Explain if geomorphic features were considered when selecting sample locations. Describe where sediments will be collected (active channel, bars, overbanks, etc)
Section 8.5.1.5	Soluble Constituents in Sediments	The text needs to describe any modification to Synthetic Precipition Leaching Procedure (SPLP) (water/soil ratio, pH adjustments?)

Section 9 Groundwater

Section 9 Groundwater		
Section/Page	**Topic**	**Comment**
Section 9 Page 5	Ground water	MMD advised the drilling of another Dakota well and Gallup well near the production well to monitor leakance from these formations during the Westwater aquifer test.
Section 9	Groundwater	General comment: The SAP should indicate that the permit application will provide a discussion on water rights.
Section 9	Groundwater	General comment: Need construction diagrams of production and monitor wells.
Section 9 Page 7	Groundwater	Describe the source of drinking water for the community of San Mateo, and explain what monitoring will take place to investigate what effect might the proposed mine dewatering might have on their source of water?
Section 9 Page 7	Groundwater	The plan should address obtaining permission from the Lee's to monitor their irrigation well during the aquifer test.
Section 9 Page 30	Groundwater	Table 9-11 needs to include the Dakota Formation as one of the aquifers to be monitored.
Section 9 Page 33	Groundwater	Table 9-13, needs to identify whether S1, S3, or S4 is to be the Pumping Well so that the related monitoring wells can be appropriately placed. The placement of the other monitoring wells, then need to be identified.

Section 10 Radiation Survey

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Section/Page	**Topic**	**Comment**
General	Radon Survey	The TLD radon 'survey' needs to be in Section 10 not Section 2.
General	Survey details	The proposed mining activity may introduce elevated ionizing radiation levels to the proposed mining area. Ionizing radiation levels will be heavily scrutinized during the mining operation and when mining ceases. Therefore, there needs to be a traceable and defensible pre-mining data collection that characterizes pre-mining radiation levels, specifically gamma radiation levels.
General	Data Quality Objectives	There needs to be a clearly stated Data Quality Objective. The objective needs to include the purpose of the survey and the 3 types of surveys needing to be performed. Collecting radiological data is a two-part process in which the intended data will be used in the years following mining commencement. The collected data is meant to ascertain 'background' or 'baseline' radiological levels prior to mining. The background data will be used as baseline values to determine whether there may be elevated gamma, as a result of RHR mining activities. Therefore, the survey should be composed of 3 types of measurements as described in (EPA et. al., 2000, MARSSIM Section 2.2 page 2-3) data collection; 1) the scanning (of which you have described), 2) soil sampling, and 3) direct measurement using the NaI scintillation counter.
Section 10.3	*Direct Radiological Sampling*	*As part of the survey RHR needs to include numerous direct radiological sampling (not to be confused with the scanning survey) with the NaI probe. The process for a 'direct measurement' sampling is defined in MARSSIM (EPA et. al., 2000, Section 2.2, page 2-3) as,* *samples obtained by placing a detector near the media being surveyed and inferring the radioactivity level directly from the detector response.* *Furthermore, the guidance for the stationary count time provided by MARSSIM (EPA et. al., 2000, Section 6, Page 10) is as follows,* *Direct measurements are taken by placing the instrument at the appropriate distance[2] above the surface, taking a discrete measurement for a pre-determined time interval (e.g., 10 s, 60 s, etc.), and recording the reading. A one minute integrated count technique is a practical field survey procedure for most equipment.* *MARSSIM (EPA et. al., 2000, Section 6.4.1.1, Page 11) recommends, at a minimum, a 10-second count for expected low-energy*

Section 10 Radiation Survey		
Section/Page	**Topic**	**Comment**
		concentrations. The minimum 10-second count is not specified, and without this time-count being specified at discrete locations and elevations, the regression from 'cps' to activity at a specific location is not defensible.
Section 10.4.2	Survey design	The presence of snow, ground moisture, humidity, dust, will affect the NaI scintillation response to gamma-rays. It needs to be specified in your survey design the weather and ground conditions at the time of survey. There needs to be stated what weather conditions will mask a response, thus warranting the survey to be postponed and resumed when more suitable conditions exist.
Section 10.4.1 - general	Probe elevation	In order to determine background, or baseline radiation levels of the soil and rock formations, the collecting instrument (in this case the NaI scintillation probe) position should be at ground surface or no more the 6 cm above the ground surfaces (MARSSIM, EPA et. al., 2000, 6.4.2.1., Page 14). The elevation of the probe is not specified in the SAP, please specify the elevation of the probe relative to the ground surface, and assure that it will be placed within 6-cm of the surface
Section 10	Shield on NaI Probe	In order to screen-out (as much as possible) gamma-ray *shine* the NaI probe needs to be shielded to assure you are obtaining gamma-ray readings at a specific location (minimally influenced by 'shine'). Additionally, the dimensions of the shield need to be stated, as different shield dimensions will screen and block different gamma-ray quantities. It is not stated whether the NaI probe is shielded or unshielded and the shield dimensions. The probe needs to be shielded in minimize shine and shield dimensions need to be specified.
Section 10.4.2.1	Scan Area	RHR needs to include baseline more detailed radiological sample measurements (discrete 10-second counts) along the proposed and existing roads (along Highway 605 in Sections 16, 9, and 10). These baseline values are important in order to determine whether there will be U-bearing ore spilled on roadways as it is hauled off the site.
Section 10.4.2.1	Check source	Per guidance from NUREG/CR 5879 - Section 5.3 - Instrument Calibration should be traceable to NIST (national institute of standards and technololgy) standards. -
Section 10.4.2.1	Calibration	RHR needs to include calibration process specifics. Such as; 1. The instrument should have a 'response records' taken at the DOE calibration pads located on Highway 605 in order to derive the correlation between set counts/minute to an known ^{226}Ra concentration (at each pad). This allows cross-checks when

Section 10 Radiation Survey

Section/Page	Topic	Comment
		future surveys are is performed with different instruments. 2. From MARSSIM (Section 6.5., Page 22) and NUREG (Section NUREG/CR 5849 - Section 5.3) NaI *probes should be calibrated against a pressurized ion chamber (PIC)*. To assure different probes accurately measure radiation levels at different times during mine operations the above guidance needs to be followed.
Section 10.4.2.2	Procedure	There needs to be objective evidence that the listed procedures have been developed to comply with the appropriate regulatory and peer reviewed standards and requirements. Provide the procedures and make sure they comply with requirements given regulatory or professional standards and requirements such as EPA QA/R-5 (EPA 1994), ASME NQA-1 (ASME 1989), ISO 9000 (ISO 1987), (IAEA). 1971 or similar regulatory procedures.

References:

EPA. 1994. *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations.* EPA QA/R-5, EPA, Draft Interim Final, Quality Assurance Management Staff, Washington, D.C.

EPA et. al., 2000. MARSSIM (EPA 402-R-97-016 REV1, NUREG-1575 REV1, DOE/EH 1624 REV1)

EPA 1980. *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*. QAMS-005/80, EPA, Washington, D.C.

IAEA. 1971. *Handbook on Calibration of Radiation Protection Monitoring Instruments.* IAEA, Technical Report Series 133, Vienna.

International Organization for Standardization (ISO). 1987.
ISO 9000/ASQC Q9000 Series. American Society for Quality Control, Milwaukee, Wisconsin.

ISO 9000-1, *Quality Management and Quality Assurance Standards - Guidelines for Selection and Use*.

ISO 9001-1, *Quality Systems - Model for Quality Assurance in Design/Development, Production, Installation and Servicing*.

ISO 9002, *Quality Systems - Model for Quality Assurance in Production and Installation, and Servicing*.

ISO 9003, *Quality Systems - Model for Quality Assurance in Final Inspection and Test*.

ISO 9004-1, *Quality Management and Quality System Elements - Guidelines*.

NUREG -1507, *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions.* June 1998.

Section 11 Historic Places and Cultural Properties

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Section/Page	**Topic**	**Comment**
Section 11.1.1	Section 9-10	"The permit area was previously surveyed as part of a larger survey (Koczan and Doleman 1976)" – This is irrelevant to the SAP; the information goes in the actual reports for Sections 9-10 - delete this sentence (1st paragraph)
Section 11.1.1	Section 9-10	**"**No cemeteries or human burials were found during the survey." – This is irrelevant to the SAP - delete this sentence (beginning of 2nd paragraph)
Section 11.1.1	Section 9-10	"The report recommended that the "eligible" and "undetermined" sites be avoided while conducting *site* activities." – replace the word "*site*" with "ground-disturbing"
Section 11.1.2	Sections 16	"The field survey conducted on Section 16 identified 54 archaeological sites; 24 sites are recommended for nomination to the National Register of Historic Places." (make underlined additions)
Section 11.1.2	Section 16	"If avoidance is not feasible, then testing and *full recording* of the sites should be performed." Replace "*full recording*" with "possibly data recovery"
Section 11.3	List of Date to be Collected	"The entire permit area (1920 acres) will be surveyed for the presence of archaeological and cultural resources *of significance*" – Delete *of significance*; all sites are recorded; significance is determined later
Section 11.4	Methods of Collection	"*The file searches were conducted using the legal descriptions of the project area and a 1.6-km radius surrounds the project area. The search areas included Sections 8, 9, 10, 15, 16, 17, 20, 21, and 22 in T13N, R8W. The results of these literature searches are summarized in the cultural resources survey reports for Sections 9 and 10, and Section 16 (LMASI 2006a and 2006b)."* – Delete this whole paragraph – it's enough to know that a records review was conducted.
Section 11.4	Methods of Collection	Following the literature searches, LMASI field personnel conducted *a walk-over* an archaeological survey of the Roca Honda permit area, evaluating existing archaeological sites identified from the literature searches and identifying and evaluating new sites not previously recorded. Transects were spaced m apart (we need to know transect spacing. 15 m?) Delete *a walk-over*
Section 11.4	Methods of Collection	*"A site can be variable in size and content and range from a cluster of several objects or materials to large areas including*

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		structures with associated objects and features. In lieu of State of New Mexico guidelines regarding site definition standards, LMASI used the USFS Region 3 guidelines (NMCRIS No. 101072) to identify cultural sites. Under these guidelines, sites must be greater than fifty years old and have: *1. One or more features* *2. One formal tool, if associated with other cultural material, or more than one formal tool* *3. An occurrence of cultural material that contains:* *Three or more types of artifacts or material* *Two types of artifacts in a density of at least 10 items per 100 square miles* *Sampling and Analysis Plan Section 11.0- Historic Places and Cultural Properties Roca Honda Mine April 2009 Page 11-3* *A single type of artifact in a density of at least 25 items per 100 square miles* *Isolated occurrences, on the other hand, are cultural remains that do not qualify as sites and generally consist of single artifacts or artifact scatters that are of extremely low density and are widely dispersed, or represent a single activity. Redeposited material that lacks significant locational context may also be determined to be an isolated occurrence."* – Delete all of this – not necessary in text
Section 11.4	Methods of Collection	Last paragraph: "Sites were plotted on USGS quadrangle maps," – <u>was this really done in the field? Usually GPS data is downloaded and plotted on a map back in the office</u>
Section 11.4	Methods of Collection	In the text, "When isolated occurrences were encountered, they were recorded in the field and *then* <u>their locations</u> plotted on the USGS quadrangle map". Delete *then*
Section 11.5	Parameters	Add at beginning: <u>all of Sections 10, 11, and 16 were surveyed.</u>
Section 11.5	Parameters	"The field surveys *identified* <u>documented</u> 94 new archaeological sites and 160 isolated occurrences in Sections 9, 10, and *50* <u>54</u> new archaeological site and 72 isolated occurrences in Section 16." Delete italicized and add underlined.
Section 11.6	Maps….	A map needs to be provided showing the mining footprint overlaid on a map of the archaeological sites. The map must include the "LA #" for each site.
Section 11.7	Sampling Frequency	"*Cultural resources are located and identified during walkover surveys in the field. These surveys have been completed for purposes of a pre-mining assessment."* Delete, and replace with <u>One hundred percent of the project area was surveyed</u>.
Section 11.8	Lab and Field	"*The Contractor retained to perform the work is certified by the*

Section 11 Historic Places and Cultural Properties		
Section/Page	**Topic**	**Comment**
	QA	*State of New Mexico to perform the historic and cultural surveys. These experienced professionals followed the accepted field procedures to conduct the surveys, mark and map the findings, and report the results."* Delete, and replace with The archaeologists are permitted by the State of NM and the USFS (Cibola).
Section 11.9	Brief Discussion Supporting Proposal	"The objective of the cultural resources surveys are to locate all archaeological sites *on or eligible for listing on either the NRHP and /or the State Register of Cultural Properties and known cemeteries and human burials* within the proposed permit area" insert archaeological

Section 12

Section 12 Present and Historic Land Use		
Section/Page	**Topic**	**Comment**
General	Exploratory boreholes	An account of when exploration boreholes were drilled needs to be discussed in this section. This needs to include specifics, including, if possible the company that drilled these holes, not a general statement that boreholes were drilled between a certain time-frame.

Section 13 Prior Mining Operations

Section 13 Prior Mining Operations		
Section/Page	**Topic**	**Comment**
Figure 13-1	Contour elevations	Please put elevations on the contour lines.
Figure 13-1	Observation well labels	Please label observation wells on the map and their respective elevations.
Section 13.1	Exploratory boreholes	There needs to be a survey planned that; 1) indentifies all exploratory boreholes and provides there UTM NAD-83 GPS/GIS coordinates (these should be include in shape files provided in the report)in the proposed mining sections, 2) depth of these boreholes, 3) diameter of the exploratory boreholes, and 4) type of plugging.
Section 13.2	Mt. Taylor dewatering	It is acknowledged that Mt. Taylor mine has been in operation from the mid-1970s to early 1980s. The mine had extensive dewatering and discharge to San Mateo creek. As a surrogate to proposed RHR mining activities, the SAP should discuss the process by which RHR will acquire and analyze data related to dewatering activities and aquifer recovery at the Mr. Taylor Mine. The SAP should also discuss the process by which RHR will acquire and analyze data that would provide information related to the impacts of Mt. Taylor discharge water to surface stream water quality, and precipitates in the alluvium.
Section 13.2	Lee Ranch Mine shaft	The SAP should indicate that details of the Lee Ranch mine shaft which is located approximately 0.5 miles west of Section 16 will be addressed in the permit application. The following questions need to be addressed; 1) How deep is the shaft? 2) Is it open? 3) How is the shaft currently being used? 4) Does the shaft serve as a ground water sink? 5) Has the shaft construction affected water in the Dakota, Gallup, or Westwater Sandstones within the vicinity of the proposed mine operations (Sections 9, 10, and 16)? 6) Is the shaft currently being used as a water well? 7) Is there going to be monitoring of this 'shaft/well'