Denison Mines (USA) Corp.
1050 17th Street, Suite 950
Denver, CO 80265
USA

Tel : 303 628-7798
Fax : 303 389-4125

www.denisonmines.com

September 11, 2009

VIA E-MAIL AND OVERNIGHT DELIVERY

Mr. Dane L. Finerfrock
Executive Secretary
Utah Radiation Control Board
Department of Environmental Quality
168 North 1950 West
P.O Box 144850
Salt Lake City, UT 84114-4850

Re: Cell 4B Lining System Design Report, Response to DRC Request for Additional Information – Round 3 Interrogatory, Cell 4B Design.

Dear Mr. Finerfrock:

We are responding to your September 4, 2009 letter requesting additional information regarding the Cell 4B Design Report.

For ease of review, the Division of Radiation Control's ("DRC's") questions are summarized below in italics with Denison Mines (USA) Corp.'s ("DMC's") responses following each question.

1. *Dike Integrity – Please provide a revised Technical Specification including the limits to be used for Peak Particle Velocity (PPV) during blasting. Please require that PPV limitation specifications be applied in the Blast Plan that is required under Technical Specification Section 02200, Articles 1.05B, 3.03B5, and 3.03B6. Please provide a Blast Plan for Utah Division of Radiation Control (DRC) review.*

Section 02200 (Earthwork) of the Technical Specifications has been revised to include the Peak Particle Velocity (PPV) limitation specifications and is provided as Exhibit A. The blast plan prepared by the contractor is provided as Exhibit B.

2. *Spillway Capacity Design/Calculations and Surface Water Runoff – Provide an estimation of the Probable Maximum Precipitation (PMP) event for the site, as well as justification for the use of the 6 hour PMP duration. Please identify, specifically, the location for compliance monitoring and all equipment, procedures, and a monitoring frequency to be used to monitor compliance at Cell 4B.*

The Probable Maximum Precipitation (PMP) event for the site was evaluated using "Hydrometeorological Report No. 49: Probable Maximum Precipitation Estimates, Colorado River and Great Basin Drainages" (Hansen, et. al., 1984). The calculation package describing assumptions and procedures is provided as Exhibit C.

Compliance monitoring and equipment, procedures, and monitoring frequency are not included as part of the Cell 4B design, as they will be covered by the facility's BAT Monitoring, Operations and Maintenance Plan. Solution monitoring procedures for Cell 4B will be duplicated from the approved Cell 4A BAT Monitoring, Operations and Maintenance Plan. The procedures for the Cell 4A solution monitoring, which will be modified as necessary for Cell 4B, are:

Solution Elevation

Measurements in Cell 4A are to be taken by survey on a weekly basis as follows:

(i) The survey will be performed by the Mill's Radiation Safety Officer or designee (the "Surveyor") with the assistance of another Mill worker (the "Assistant");
(ii) The survey will be performed using a survey instrument (the "Survey Instrument") accurate to 0.01 feet, such as a Sokkai No. B21, or equivalent, together with a survey rod (the "Survey Rod") having a visible scale in 0.01 foot increments;
(iii) The reference Points (the "Reference Points") for Cells 4A are known points established by Registered Land Surveyor. For Cell 4A, the Reference Point is a piece of metal rebar located on the dike between Cell 3 and Cell 4A. The elevation at the top of this piece of rebar (the Reference Point Elevation for Cell 4A is at 5,607.83 feet above mean sea level ("amsl");
(iv) The Surveyor will set up the Survey Instrument in a location where both the applicable Reference Point and pond surface are visible. For Cell 4A, this is typically on the road between Cell 3 and Cell4A, approximately 100 feet east of the Cell 4A Reference Point;
(v) Once in location, the Surveyor will ensure that the Survey Instrument is level by centering the bubble in the level gauge on the Survey Instrument;
(vi) The Assistant will place the Survey Rod vertically on the Cell 4A Reference Point. The Assistant will ensure that the Survey Rod is vertical by gently rocking the rod back and forth until the Surveyor has established a level reading;
(vii) The Surveyor will focus the cross hairs of the Survey Instrument on the scale on the Survey Rod, and record the number (the "Reference Point Reading"), which represents the number of feet the Survey Instrument is reading above the Reference Point;
The Assistant will then move to a designated location where the Survey Rod can be placed on the surface of the main solution pond in Cell 4A. The designated location for Cell 4A is in the northeast corner of the Cell where the side slope allows for safe access to the solution surface.

The approximate coordinate locations for the measuring points for Cell 4A is 2,579,360 east, and 320,300 north. These coordinate locations may vary somewhat depending on solution elevations in the Cell.

The Assistant will hold the Survey Rod vertically with one end of the Survey Rod just touching the pond surface. The Assistant will ensure that the Survey Rod is vertical by gently rocking the rod back and forth until the Surveyor has established a level reading;

(viii) The Surveyor will focus the cross hairs of the Survey Instrument on the scale on the Survey Rod, and record the number (the "Pond Surface Reading"), which represents the number of feet the Survey Instrument is reading above the pond surface level.

The Surveyor will calculate the elevation of the pond surface in feet amsl by adding the Reference Point Reading for the Cell and subtracting the Pond Surface Reading for the Cell, and will record the number accurate to 0.01 feet.

If you have any additional questions please feel free to contact me at (303) 389-4160.

Very truly yours,

Harold R. Roberts
Executive Vice President – U. S. Operations

cc: Ron F. Hochstein, DUSA
Gregory T. Corcoran, Geosyntec

Attached:

Exhibit A – Revised Section 02200 of the Technical Specifications
Exhibit B – Blast Plan, prepared by KGL Associates
Exhibit C – Probable Maximum Precipitation (PMP) Event Calculation Package

References:

Hansen, E. Marshall, Schwartz, Francis K., Riedel, John T., 1984. "Hydrometeorological Report No. 49: Probable Maximum Precipitation Estimates, Colorado River and Great Basin Drainages," Hydrometeorological Branch Office of Hydrology National Weather Service, U.S. Department of Commerce, National Oceanic and Atmosphere Administration, U.S. Department of Army Corps of Engineers, Silver Springs, Md.

DUSA, Cell 4A BAT Monitoring, Operations and Maintenance Plan, 09/08 Revision Denison 1.3

DENISON MINES

EXHIBIT A

REVISED SECTION 02200 OF THE TECHNICAL SPECIFICATIONS

SECTION 02200
EARTHWORK

PART 1 — GENERAL

1.01 DESCRIPTION OF WORK

A. The Contractor shall furnish all labor, materials, tools, supervision, transportation, equipment, and incidentals necessary to perform all Earthwork. The Work shall be carried out as specified herein and in accordance with the Drawings.

B. The Work shall include, but not be limited to excavating, blasting, ripping, trenching, hauling, placing, moisture conditioning, backfilling, compacting and grading. Earthwork shall conform to the dimensions, lines, grades, and sections shown on the Drawings or as directed by the Construction Manager.

1.02 RELATED SECTIONS

Section 02220 – Subgrade Preparation

1.03 REFERENCES

A. Drawings

B. Latest version of American Society for Testing and Materials (ASTM) standards:

ASTM D 422	Standard Method for Particle-Size Analysis of Soils
ASTM D 1557	Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb-ft/ft^3 (2,700 kN-m/m^3))
ASTM D 6938	Standard Test Method for In-Place Density and Water Content of Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.04 QUALIFICATIONS

A. The Contractor's Site superintendent for the earthworks operations shall have supervised the construction of at least two earthwork construction projects in the last 5 years.

1.05 SUBMITTALS

A. The Contractor shall submit to the Construction Manager a description of equipment and methods proposed for excavation, and fill placement and compaction construction at least 14 days prior to the start of activities covered by this Section.

B. If rock blasting is the chosen rock removal technique, the Contractor shall submit to the Construction Manager a blast plan describing blast methods to remove rock to proposed grade. The blast plan shall include a pre-blast survey, blast schedule, seismic monitoring records, blast design and diagrams, and blast safety. The Contractor shall submit the plan to the Construction Manager at least 21 days prior to blast.

C. If the Work of this Section is interrupted for reasons other than inclement weather, the Contractor shall notify the Construction Manager a minimum of 48 hours prior to the resumption of Work.

D. If foreign borrow materials are proposed to be used for any earthwork material on this project, the Contractor shall provide the Construction Manager information regarding the source of the material. In addition, the Contractor shall provide the Construction Manager an opportunity to obtain samples for conformance testing 14 days prior to delivery of foreign borrow materials to the Site. If conformance testing fails to meet these Specifications, the Contractor shall be responsible for reimbursing the Owner for additional conformance testing costs.

E. The Contractor shall submit as-built Record Drawing electronic files and data, to the Construction Manager, within 7 days of project substantial completion, in accordance with this Section.

1.06 QUALITY ASSURANCE

A. The Contractor shall ensure that the materials and methods used for Earthwork meet the requirements of the Drawings and this Section. Any material or method that does not conform to these documents, or to alternatives approved in writing by the Construction Manager will be rejected and shall be repaired, or removed and replaced, by the Contractor at no additional expense to the Owner.

B. The Contractor shall be aware of and accommodate all monitoring and field/laboratory conformance testing required by the Contract Documents. This monitoring and testing, including random conformance testing of construction materials and completed Work, will be performed by the CQA Engineer. If nonconformances or other deficiencies are found in the materials or completed Work, the Contractor will be required to repair the deficiency or replace the deficient materials at no additional cost to the Owner.

PART 2 — PRODUCTS

2.01 MATERIAL

A. Fill material shall consist of on-site soil obtained from excavation or owner provided stockpile and shall be free from rock larger than 6 inches, organic or other deleterious material.

B. Rock shall consist of all hard, compacted, or cemented materials that require blasting or the use of ripping and excavating equipment larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than 1 cubic yard encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation. The presence of isolated boulders or rock fragments larger than 1 cubic yard is not in itself sufficient to cause to change the classification of the surrounding material.

C. Rippable Soil and Rock: Material that can be ripped at more than 250 cubic yards per hour for each Caterpillar D9 dozer (or equivalent) with a single shank ripper attachment.

2.02 EQUIPMENT

A. The Contractor shall furnish, operate, and maintain compaction equipment as is necessary to produce the required in-place soil density and moisture content.

B. The Contractor shall furnish, operate and maintain tank trucks, pressure distributors, or other equipment designed to apply water uniformly and in controlled quantities.

C. The Contractor shall furnish, operate, and maintain miscellaneous equipment such as earth excavating equipment, earth hauling equipment, and other equipment, as necessary for Earthwork construction.

D. The Contractor shall be responsible for cleaning up all fuel, oil, or other spills, at the expense of the Contractor, and to the satisfaction of the Construction Manager.

PART 3 — EXECUTION

3.01 FAMILIARIZATION

A. Prior to implementing any of the Work in this Section, the Contractor shall become thoroughly familiar with the Site, the Site conditions, and all portions of the Work falling within this and other related Sections.

B. Inspection:

1. The Contractor shall carefully inspect the installed Work of all other Sections and verify that all Work is complete to the point where the installation of the Work specified in this Section may properly commence without adverse impact.

2. If the Contractor has any concerns regarding the installed Work of other Sections, the Construction Manager shall be notified in writing prior to commencing Work. Failure to notify the Construction Manager, or commencement of the Work of this Section, will be construed as Contractor's acceptance of the related Work of all other Sections.

3.02 SOIL EXCAVATION

A. The Contractor shall excavate materials to the limits and grades shown on the Drawings.

B. The Contractor shall rip, blast, and mechanically remove rock 6-inches below final grades shown on the Drawings.

C. All excavated material not used as fill shall be stockpiled as shown on the Drawings and in accordance with Subpart 3.05 of this Section.

3.03 ROCK EXCAVATION

A. The Contractor shall remove rock by ripping, drilling, or blasting, or as approved by Construction Manager.

B. Requirements for Blasting:

1. The Contractor shall arrange for a pre-blast survey of nearby buildings, berms, or other structures that may potentially be at risk from blasting damage. The survey method used shall be acceptable to the Contractor’s insurance company. The Contractor shall be responsible for any damage resulting from blasting. The preblast survey shall be made available for review three weeks before any blasting begins. Pre-blast surveys shall be completed by a practicing civil engineer registered in the State of Utah, who has experience in rock excavation and geotechnical design.

2. The Contractor shall submit for review the proposed methods and sequence of blasting for rock excavations. The Contractor shall identify the number, depth, and spacing of holes; stemming and number and type of delays; methods of controlling overbreak at excavation limits, procedures for monitoring the shots and recording information for each shot; and other data that may be required to control the blasting.

3. Blasting shall be done in accordance with the federal, state, or local regulatory requirements for explosives and firing of blasts. Such regulations shall not relieve the Contractor of any responsibility for damages caused by them or their employees due to the work of blasting. All blasting work must be performed or supervised by a licensed blaster who shall at all times have a license on their person and shall permit examination thereof by the Engineer or other officials having jurisdiction.

4. The Contractor shall develop a trial blasting technique that identifies and limits the vibrations and damage at varying distances from each shot. This trial blasting information shall be collected and recorded by beginning the work at points farthest from areas to remain without damage. The Contractor can vary the hole spacing, depths and orientations, explosive types and quantities, blasting sequence, and delay patterns to obtain useful information to safeguard against damage at critical areas.

5. Establish appropriate maximum limit for peak particle velocity for each structure or facility that is adjacent to, or near blast sites. Base maximum limits on expected sensitivity of each structure or facility to blast induced vibrations and federal, state, or local regulatory requirements. In areas of blasting within 100 feet from the top of the existing berms, the blasting peak particle velocities (PPV) shall not exceed 2 inches per second.

6. The Contractor shall discontinue any method of blasting which leads to overshooting or is dangerous to the berms surrounding the existing pond structures.

7. The Contractor shall install a blast warning sign to display warning signals. Sign shall indicate the following:

   a. Five (5) minutes before blast: Three (3) long sounds of airhorn or siren

   b. Immediately before blast: Three (3) short sounds of airhorn or siren

   c. All clear signal after blast: one (1) long sound of airhorn or siren

3.04 FILL

A. Prior to fill placement, areas to receive fill shall be cleared and grubbed.

B. The fill material shall be placed to the lines and grades shown on the Drawings.

C. Soil used for fill shall meet the requirements of Subpart 2.01 of this Section.

D. Soil used for fill shall be placed in a loose lift that results in a compacted lift thickness of no greater 8 inches and compacted to 90% of the maximum density at a moisture content of between -3% and +3% of optimum moisture content, as determined by ASTM D 1557.

E. The Contractor shall utilize compaction equipment suitable and sufficient for achieving the soil compaction requirements.

F. During soil wetting or drying, the material shall be regularly disced or otherwise mixed so that uniform moisture conditions in the appropriate range are obtained.

3.05 STOCKPILING

A. Soil suitable for fill and excavated rock that is required to be stockpiled shall be stockpiled, separately, in areas as shown on the Drawings or as designated by the Construction Manager, and shall be free of incompatible soil, clearing debris, or other objectionable materials.

B. Stockpiles shall be no steeper than 2H:1V (Horizontal:Vertical) or other slope approved by the Design Engineer, graded to drain, sealed by tracking parallel to the slope with a dozer or other means approved by the Construction Manager, and dressed daily during periods when fill is taken from the stockpile. The Contractor shall employ temporary erosion and sediment control measures (i.e. silt fence) as directed by the Construction Manager around stockpile areas.

C. There are no compaction requirements for stockpiled materials.

3.06 FIELD TESTING

A. The minimum frequency and details of quality control testing for Earthwork are provided below. This testing will be performed by the CQA Engineer. The Contractor shall take this testing frequency into account in planning the construction schedule.

1. The CQA Engineer will perform conformance tests on placed and compacted fill to evaluate compliance with these Specifications. The dry density and moisture content of the soil will be measured in-situ with a nuclear moisture-density gauge in accordance with ASTM D 6938. The frequency of testing will be one test per 500 cubic yards of soil place.

2. A special testing frequency will be used by the CQA Engineer when visual observations of construction performance indicate a potential problem. Additional testing will be considered when:

   a. The rollers slip during rolling operation;
   b. The lift thickness is greater than specified;
   c. The fill is at improper and/or variable moisture content;
   d. Fewer than the specified number of roller passes are made;
   e. Dirt-clogged rollers are used to compact the material;
   f. The rollers do not have optimum ballast; or
   g. The degree of compaction is doubtful.

3. During construction, the frequency of testing will be increased by the Construction Manager in the following situations:

   a. Adverse weather conditions;
   b. Breakdown of equipment;
   c. At the start and finish of grading;
   d. If the material fails to meet Specifications; or
   e. The work area is reduced.

B. Defective Areas:

1. If a defective area is discovered in the Earthwork, the CQA Engineer will evaluate the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, the CQA Engineer will determine the extent of the defective area by additional tests, observations, a review of records, or other means that the Construction Manager deems appropriate. If the defect is related to adverse Site conditions, such as overly wet soils or surface desiccation, the CQA Engineer shall define the limits and nature of the defect.

2. Once the extent and nature of a defect is determined, the Contractor shall correct the deficiency to the satisfaction of the CQA Engineer. The Contractor shall not perform additional Work in the area until the Construction Manager approves the correction of the defect.

3. Additional testing may be performed by the CQA Engineer to verify that the defect has been corrected. This additional testing will be performed before any additional Work is allowed in the area of deficiency. The cost of the additional Work and the testing shall be borne by the Contractor.

3.07 SURVEY CONTROL

A. The Contractor shall perform all surveys necessary for construction layout and control.

3.08 CONSTRUCTION TOLERANCE

A. The Contractor shall perform the Earthwork construction to within ±0.1 vertical feet of elevations on the Drawings.

3.09 AS-BUILT SURVEY

A. For purposes of payment on Earthwork quantities, the Contractor shall conduct a comprehensive as-built survey that complies with this Section.

B. The Contractor shall produce complete electronic as-built Record Drawings in conformance with the requirements set forth in this Section. This electronic file shall be provided to the Construction Manager for verification.

C. The Contractor shall produce an electronic boundary file that accurately conforms to the project site boundary depicted on the plans or as modified during construction by approved change order. The electronic file shall be provided to the Construction Manager for verification prior to use in any earthwork computations or map generation.

D. As-built survey data shall be collected throughout the project as indicated in these Specifications. This data shall be submitted in hard-copy and American Standard Code for Information Interchange (ASCII) format. ASCII format shall include: point number, northing and easting, elevations, and descriptions of point. The ASCII format shall be as follows:

1. PPPP,NNNNNN.NNN,EEEEEE.EEE,ELEV.XXX,Description

a. Where:

- P – point number
- N- Northing
- E – Easting
- ELEV.XXX – Elevation
- Description – description of the point

3.10 PROTECTION OF WORK

A. The Contractor shall use all means necessary to protect completed Work of this Section.

B. At the end of each day, the Contractor shall verify that the entire work area is left in a state that promotes drainage of surface water away from the area and from finished Work. If threatening weather conditions are forecast, soil surfaces shall be seal-rolled at a minimum to protect finished Work.

C. In the event of damage to Work, the Contractor shall make repairs and replacements to the satisfaction of the Construction Manager, at the expense of the Contractor.

PART 4 — MEASUREMENT AND PAYMENT

4.01 GENERAL

A. All earthwork quantities shall be independently verified by the Design Engineer prior to approval. The independent verification by the Design Engineer shall utilize the same basic procedures as those used by the Contractor.

B. Any interim or soon-to-be buried (or otherwise obstructed) earthwork shall be surveyed and quantified as the project progresses to enable timely verification by the Design Engineer.

C. Providing for and complying with the requirements set forth in this Section for Soil Excavation will be measured as in-place cubic yards (CY), prior to the excavation, and payment will be based on the unit price provided on the Bid Schedule.

D. Providing for and complying with the requirements set forth in this Section for Rock Excavation will be measured as in-place cubic yards (CY), prior to the excavation, and payment will be based on the unit price provided on the Bid Schedule.

E. Providing for and complying with the requirements set forth in this Section for Fill will be measured as compacted and moisture conditioned cubic yards (CY), and payment will be based on the unit price provided on the Bid Schedule.

F. The following are considered incidental to the work:

- Submittals.
- Quality Control.
- Material samples, sampling, and testing.
- Excavation.
- Blasting, ripping, and hammering.
- Loading, and hauling.
- Scarification.
- Screening.
- Layout survey.
- Rejected material removal, retesting, handling, and repair.
- Temporary haul roads.
- Erosion control.
- Dust control.
- Spill cleanup.
- Placement, compaction, and moisture conditioning.
- Stockpiling.
- Record survey.

[END OF SECTION]

EXHIBIT B

BLAST PLAN, PREPARED BY KGL ASSOCIATES

Geosyntec consultants

10875 Rancho Bernardo Road, Suite 200
San Diego, CA 92127
PH 858.674.6559
FAX 858.674.6586
www.geosyntec.com

10 September 2009

Mr. Harold Roberts
Denison Mines (USA) Corp.
6425 Highway 191
P.O. Box 809
Blanding, UT 84511

Subject: Blast Plan Review
Cell 4B Construction
White Mesa Mill
Blanding, Utah

Dear Mr. Roberts:

Geosyntec Consultants (Geosyntec) has prepared this letter report to document our review of the Blast Plan for the subject project. Geosyntec has reviewed the two letters prepared by Buckley Powder Company (blasting subcontractor) dated 6 August and 9 September 2009, which constitute the Blast Plan. Geosyntec reviewed the Blast Plan for compliance with the project plans and specifications for the construction of Cell 4B at the White Mesa Mill in Blanding, Utah.

Based on our review of the Blast Plan, we understand that the blasting subcontractor will blast one "signature hole" which will be monitored to evaluate the site specific rock characteristics with respect to blasting. The signature hole will use 23 pounds of explosives per delay with 7 feet of stemming in a 4-inch diameter hole. Based on the results of the "signature hole" blast, the Blast Plan may be modified to account for the site specific rock characteristics. The "signature hole" blast will be performed more than 100 feet from the nearest existing berm and has a calculated peak particle velocity (PPV) of less than 2 inches per second (IPS).

If the site specific rock characteristics from the initial blast do not change, the Blast Plan specifies that production blasting will be performed using 6½-inch diameter blast holes with approximately 234 pounds of explosives per hole with no decking per hole. A minimum 8 millisecond (ms) delay between adjacent blast holes will be used based on the timing sequence provided. However, two blast holes may be blasted simultaneously for the 1st opening cut blast, resulting in 468 pounds of explosives per delay. Based on the conservative assumptions for the rock characteristics and the distance to the nearest structure (including earthen berms), the calculated PPV is less than 5 IPS. As indicated in the Blast Plan a minimum cover soil thickness of 3 feet should be maintained over the areas to be blasted.

Based on our review we have no objections to the Blast Plan. Subsequent to the initial "signature hole" blast, a revised Blast Plan should be submitted which incorporates the findings of the initial blast and addresses the maximum pounds of explosives per delay within 100 feet of the existing earthen berms.

If you have any questions or if you need additional information please contact Mr. Jim Cox at 858.674.6559.

Sincerely,

Steven M. Fitzwilliam
Associate, Geotechnical Engineer

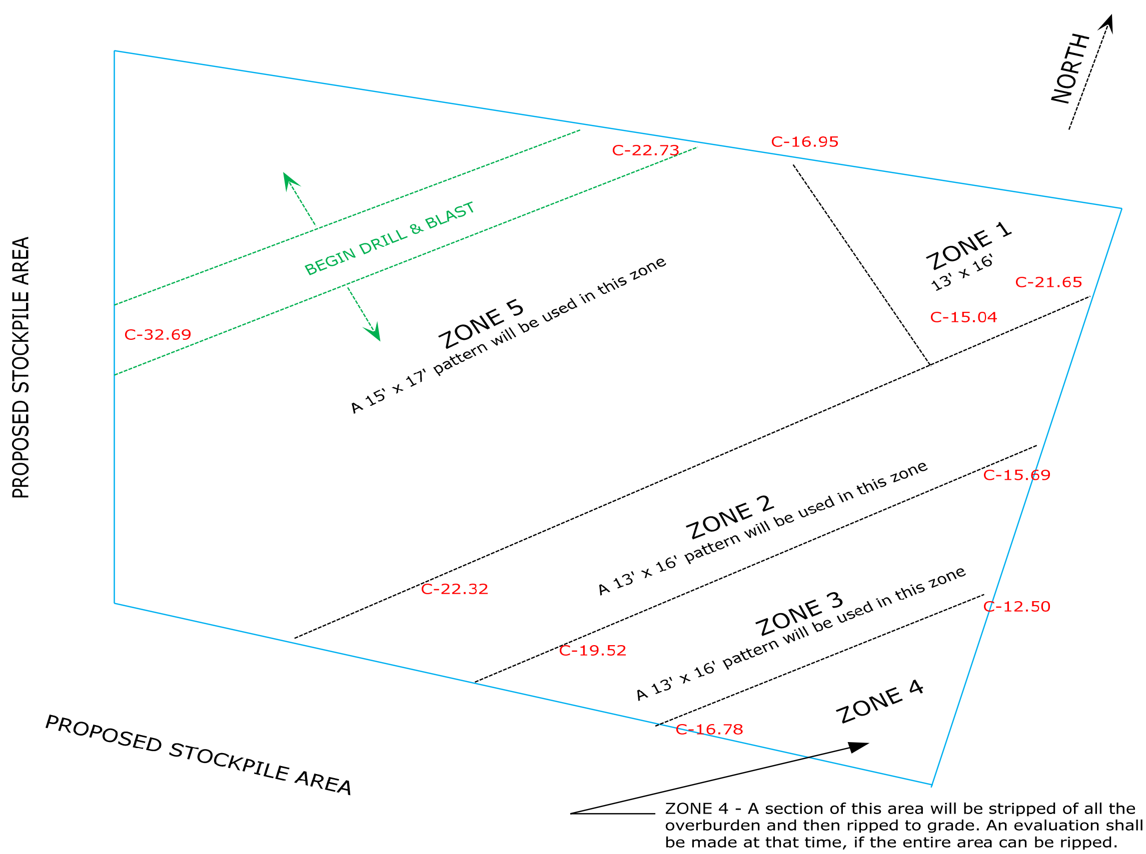
August 6, 2009

Mr. Mark Kerr
KGL and Associates
Golden CO.

RE: Blanding, UT. – Evaporation cell construction for Denison Mining.

Dear Mark,

Please make reference to our recent meeting at your office and to our many conversations concerning the above mentioned project. The existing situation of the conditions at the site are perfect for a successful drilling and blasting program. The right amount of overburden is on top of the rock to keep the explosive energy within the rock mass. As we have spoke of before, to remove any overburden will severely compromise the blasting safety and efficiency.



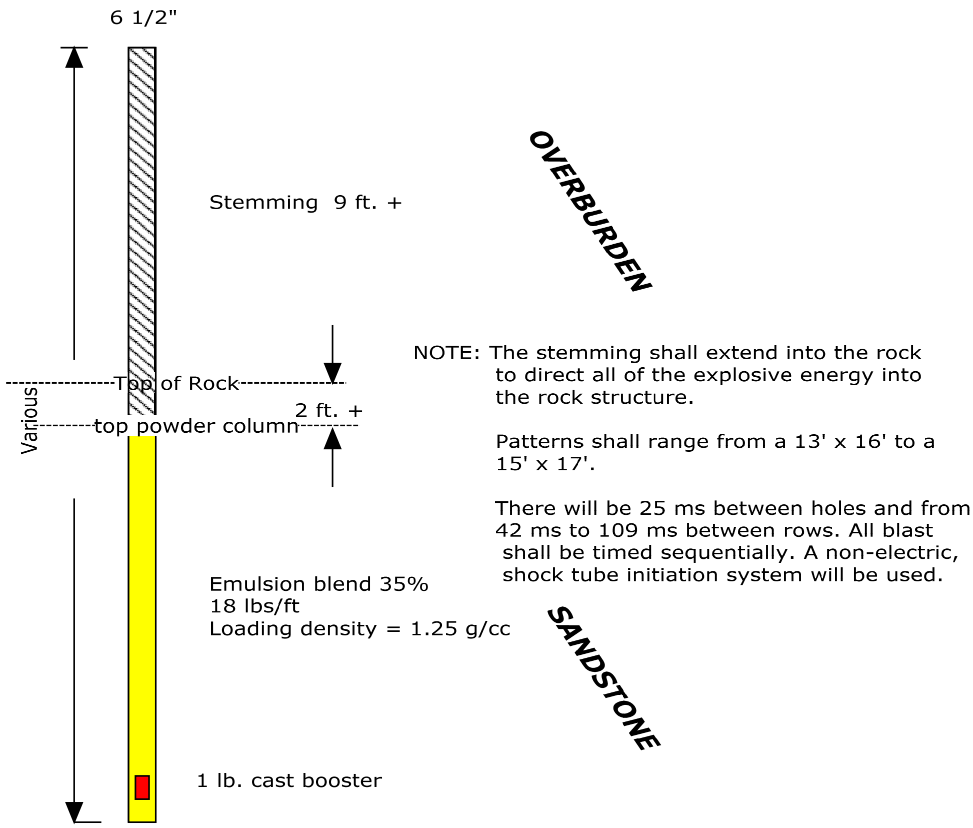
The previous sketch shows the proposed evaporation cell and how it has been divided into blasting zones. The boundaries of these said zones were determined by the total excavation depth.

The overburden on top of the rock is to be left in place for the drilling and blasting. Below, please note the excavation data (Averaged) for each of the zones:

	SURFACE TO FINAL	SURFACE TO TOP/ROCK	TOP/ROCK TO FINAL
ZONE 1	CUT – 17’	CUT – 7’	CUT – 10’
ZONE 2	CUT – 19’	CUT – 8’	CUT – 11’
ZONE 3	CUT – 16’	CUT – 8’	CUT – 8’
ZONE 4	CUT – 13’	CUT – 5’	CUT – 8’
ZONE 5	CUT – 25’	CUT – 11’	CUT – 14’

As the above chart indicates, Zone 4 has the lease amount of excavation in terms of depth. This is why this area has been chosen to test for the excavation being performed by conventional equipment. (ripping)

BLASTING DETAILS



Vibration or air overpressure will not be a problem at the existing mill structures that are 3,000 ft away. A seismograph will be placed at the structure closest to the blast for every blast that is done.

DRILLING AND BLASTING LOGISTICS

The drilling and blasting will commence in the area shown on a previous sketch toward the Northwest portion of the proposed cell. This slot will be blasted from the North excavation limits to the limits on the West side of the cell.

After partial excavation of the slot, blasting will proceed in both directions, perpendicular to the slot. This will provide the relief needed to reduce the ground vibrations at the outer limits of the cell and also direct the shots away from the other existing evaporation cells.

The excavation of the shot material from one blast, shall be performed on one side of the slot, while another blast is being prepared on the opposite side. It might be necessary to establish another area of excavation, so that the drilling and blasting operation can stay well ahead of the excavation crew.

Sincerely,

Rod A. Schuch
Buckley Powder Company

September 9, 2009

Mr. Mark Kerr
KGL and Associates
Golden, CO.

RE: Blanding Utah – Evaporation cell construction for Denison Mining.

Dear Mark,

Please make reference to our recent conversation.

Concerns about the ground response at the existing berms that border this new construction require limitations as follows:

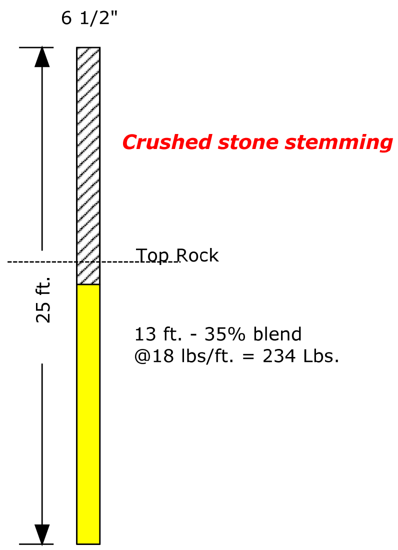
1) 5 inches per second when blasting further than 100 ft. from the berm.
2) 2 inches per second when blasting within 100 ft. of the berm.

The seismographs should be place at or near the water line on the pond side of the Berm.

BLASTING PLAN

We will record the seismic data from a signature hole and an acceptable blasting plan for blasting close to the berm areas, will be formulated using this data. We will continue to monitor every blast and chart the seismic information to determine when to change the blasting design.

The blasting details will remain as illustrated for the first blast, as the following calculation confirms that the vibratory response will be within the limitations. This calculation was developed by the USBM to predict blast induced ground vibrations and has proven to have an acceptable level of precision.



$V = 242 \times (400'/468\ lbs^{.5})^{-1.6}$

V = 2.27 ips

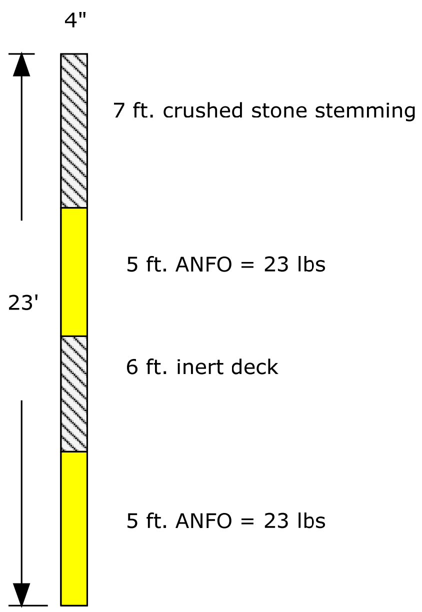
This shot is located toward the Northwest end of Zone 5 and situated in the middle of the proposed cell. Once a face has been established, the pattern dimensions and orientation of the boreholes will be changed. (Staggered pattern – 13 x 16' and larger)

SIGNATURE HOLE

Before or after this initial blast, a single hole will be detonated and the seismic data recorded and used in a wave form analysis program.

This program utilizes super imposed linear positioning of the wave forms to promote the destructive interference of the wave forms generated by blasting. The software was developed by Randy Wheeler of White Seismology and has proven to be accurate and precise in calculating the sequential times for the blast that will produce the lowest PPV and the highest frequencies possible in the chosen environment. It is imperative however, that electronic detonators be utilized to duplicate the calculated times exactly.

When blasting nears the berm areas, a decision by Denison must be made in reference to the State imposed vibration restrictions. The following is an illustration of the blast hole design (decked) needed to ensure the compliance to the vibration limits.



$V = 242 \text{ X } (100'/23LBS^{.5})^{-1.6}$

V = 1.88 IPS

It is essential to the non-duplicating of nominal firing times, that electronic detonators are used. Each explosive deck in the hole will be fired at different times. The pattern will be a 9' x 12' and a 4" hole will be used.

As I have previously stated, the pattern and explosive loading design will change as we approach the berm areas and we will monitor each blast to determine and predict when these changes are needed. The above illustration represents the blast design needed at 100’ from the berm. The ‘in field’ seismic monitoring will determine if this extreme design is needed.

We will take great care in ensuring that the vibration limitations are adhered to.

Sincerely,

Rod A. Schuch
Engr. Special Projects

EXHIBIT C

PROBABLE MAXIMUM PRECIPITATION (PMP) EVENT CALCULATION PACKAGE

Geosyntec
consultants

COMPUTATION COVER SHEET

Client:	**DMC**	Project:	**White Mesa Mill – Cell 4B**	Project/ Proposal No.: Task No.	**SC0349**

Title of Computations: **PROBABLE MAXIMUM PRECIPITATION (PMP) EVENT COMPUTATION**

Computations by:	Signature	[signature]	Date 9/4/09
	Printed Name	Meghan Lithgow	
	Title	Senior Staff Engineer	
Assumptions and Procedures Checked by: (peer reviewer)	Signature	[signature]	Date 9/9/09
	Printed Name	Rebecca Flynn, PE	
	Title	Engineer	
Computations Checked by:	Signature	[signature]	Date 9/9/09
	Printed Name	Meghan Lithgow	
	Title	Senior Staff Engineer	
Computations backchecked by: (originator)	Signature	[signature]	Date 9/9/09
	Printed Name	Meghan Lithgow	
	Title	Senior Staff Engineer	
Approved by: (pm or designate)	Signature	[signature]	Date 9/10/09
	Printed Name	Gregory T. Corcoran, PE	
	Title	Principal	

Approval notes:

Revisions (number and initial all revisions)

No.	Sheet	Date	By	Checked by	Approval

Written by:	**M. Lithgow**	Date:	**09/04/09**	Reviewed by:	**G. Corcoran**	Date:	**9/10/09**
Client:	**DMC**	Project:	**White Mesa Mill-Cell 4B**	Project/ Proposal No.:	**SC0349**	Task No.:	**02**

PROBABLE MAXIMUM PRECIPITATION (PMP) EVENT COMPUTATION
WHITE MESA MILL – CELL 4B
BLANDING, UTAH

OBJECTIVE

The purpose of this calculation is to evaluate the local-storm Probable Maximum Precipitation (PMP) event for the White Mesa Mill Facility site located in Blanding, Utah. This calculation demonstrates that the probable maximum precipitation (PMP) event that the site will experience is 10 inches (0.83 ft) in 6 hours.

PMP COMPUTATION PROCEDURE

The Probable Maximum Precipitation (PMP) for the site was evaluated using "Hydrometeorological Report No. 49: Probable Maximum Precipitation Estimates, Colorado River and Great Basin Drainages" (Hansen, et. al., 1984). The use of this method is cited in a hydrology report that was prepared as part of an agreement between UMETCO and the Nuclear Regulatory Commission (NRC) during the permitting of Cell 4A (UMETCO, 1990).

PROBABLE MAXIMUM PRECIPITATION EVENT CALCULATIONS

Step 1: Calculate the Average 1-hr 1-mi^2 PMP for drainage using Figure 4.5

The average 1-hr 1-mi^2 PMP is 8.6-in (Attachment A, 1/7)

Step 2a: Reduce the 1-hr 1-mi^2 PMP event for elevation

If the lowest elevation within the drainage is above 5,000 feet (ft) above Mean Seal Level (MSL), decrease the PMP value from Step 1 by 5% for each 1,000 ft or proportionate fraction thereof above 5,000 ft to obtain the elevation adjusted drainage average 1-hr 1-mi^2 PMP.

The elevation of Cell 4B is 5,598 ft above MSL, which is conservatively the lowest elevation for the completed cells 2 through 4B; therefore, it is required to interpolate

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between 95% and 100% using the following equation:

$$\frac{5\,\%}{1{,}000\ ft} = \frac{x\,\%}{598\ ft}$$; x = 3% reduction

100 % - 3 % = 97 %

Therefore, reduce the value obtained in Step 1 by 97%.

Step 2b: Multiply the number calculated in Step 1 by the number calculated in Step 2a.

8.6 inches x 0.97 = 8.3 inches

Step 3: Determine the average 6/1-hr ratio for drainage using Figure 4.7

The average 6/1-hr ratio for drainage is approximately 1.2. (Attachment A, 2/7)

Step 4: Calculate the durational variation for 6/1-hr ratio of Step 3 using Table 4.4

The durational value is determined using Table 4.4 is as follows: (Attachment A, 3/7)

Duration (hr)									
¼	½	¾	1	2	3	4	5	6	
74	89	95	100	110	115	118	119	120	%

Step 5: Multiply step 2b by Step 4 to calculate the 1-mi^2 PMP for indicated durations

For example, for the ¼ hour duration: 8.3 x 0.74 = 6.1

The following numbers are calculated as follows:

Duration (hr)									
¼	½	¾	1	2	3	4	5	6	
6.1	7.4	7.9	8.3	9.1	9.5	9.8	9.9	10.0	in.

Step 6: Determine the areal reduction using Figure 4.9 for the site:

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First, determine the total watershed contributing to Cell 4B, including Cell 4B. The watershed areas of the upstream Cells 2, 3, and 4A are 87 acres (ac), 83 ac, and 40 ac, respectively and the proposed Cell 4B is 42 ac. Areas outside of these cells do not drain to Cell 4B and are therefore not part of the watershed area.

Total acreage is 87 ac + 83 ac + 42 ac + 42 ac = 254 acres.
Next, convert this number into square miles:

$$254\ acre\ x\ \frac{43{,}560\ ft^2}{1\ acre}\ x\ \frac{(1mi)^2}{(5{,}280\ ft)^2} = 0.40\ mi^2$$

Using Figure 4.9, the depth ratio of ≤1 mi^2 is 100 percent for each of the durations (Attachment A, 4/7).

<u>Step 7: Multiply the duration values in Step 5 by the areal reduction in Step 6 to calculate the areal reduced PMP.</u>

This step is neglected because the depth ratio is 100 percent; therefore, the values obtained in Step 5 are not reduced.

<u>Step 8: Calculate the incremental PMP using successive subtraction of the values in Step 7 for the hourly durations (1 hr through 6 hr) and 15-minute incremental durations (1/4 hr through 1 hr).</u>

The incremental PMP is calculated in two separate steps; the incremental PMP is calculated on the first line for the hourly increments (hours 1 through 6) and then calculated on the second line for the 15-minute increments during the first hour of the storm. To determine the incremental PMP, the following formula is used:

$PMP_{t\ to\ t+1} = PMP_{t+1} - PMP_t$, where t = time

In this example, the PMP between the first interval and second interval is determined by subtracting the PMP for interval 1 from the PMP for the second interval, as calculated in Step 5. The following equation illustrates the calculation of the incremental PMP between hours 0 and 1:

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$$PMP_1 - PMP_0 = 8.3 \text{ in} - 0 \text{ in.} = 8.3 \text{ in.}$$

The next equation illustrates the calculation of the incremental PMP between hours 1 and 2:

$$PMP_2 - PMP_1 = 9.1 \text{ in} - 8.3 \text{ in.} = 0.8 \text{ in.}$$

This calculation is continued until the following table is completed as shown for each PMP interval.

Duration (hr)									
¼	½	¾	1	2	3	4	5	6	
			8.3	0.8	0.4	0.2	0.1	0.1	in.
6.1	1.2	0.5	0.4						in.

<u>Step 9: Order the incremental PMP in a sequence dictated by hourly and 15-minute increments using Table 4.7 (Attachment 5/7) and Table 4.8 (Attachment 6/7), respectively.</u>

The incremental PMP calculated in Step 8 must now be arranged in a specific order to model the runoff generated by the storm event. This order is dictated by Table 4.7 for the hourly PMP intervals and Table 4.8 for the 15-minute PMP intervals.

The final arrangement of the numbers determined in Step 8 is as follows:

Hourly increments:	0.1	0.4	8.3	0.8	0.2	0.1	in.
15-minute increments:	6.1	1.2	0.5	0.4			in.

The storm's 6 hour PMP runoff event is calculated by summing the incremental PMP for each hour of the storm.

0.1 in. + 0.4 in. + 8.3 in. + 0.8 in. + 0.2 in. + 0.1 in. = 9.9 inches **(10 inches).**

This step is repeated to calculate the runoff generated during the first hour of the storm.

6.1 in. + 1.3 in. + 0.5 in. + 0.4 in. = 8.3 inches

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Because 9.9 > 8.3, the runoff generated from the 6 hour storm (9.9 inches) is used.

CONCLUSIONS AND RECOMMENDATIONS

Our calculations are summarized in a worksheet modeled after Table 6.3A in the Hydrometerological Report No. 49 and is provided as Attachment A, 7/7. Our analysis determined the Probable Maximum Precipitation (PMP) event generates 10 inches (0.83 ft) over 6 hours.

REFERENCES

UMETCO Minerals Corporation, 1990, “White Mesa Mill Drainage Report for Submittal to NRC.”

Attachment A

Hansen, E. Marshall, Schwartz, Francis K., Riedel, John T., 1984. “Hydrometeorological Report No. 49: Probable Maximum Precipitation Estimates, Colorado River and Great Basin Drainages,” Hydrometeorological Branch Office of Hydrology National Weather Service, U.S. Department of Commerce, National Oceanic and Atmosphere Administration, U.S. Department of Army Corps of Engineers, Silver Springs, Md.

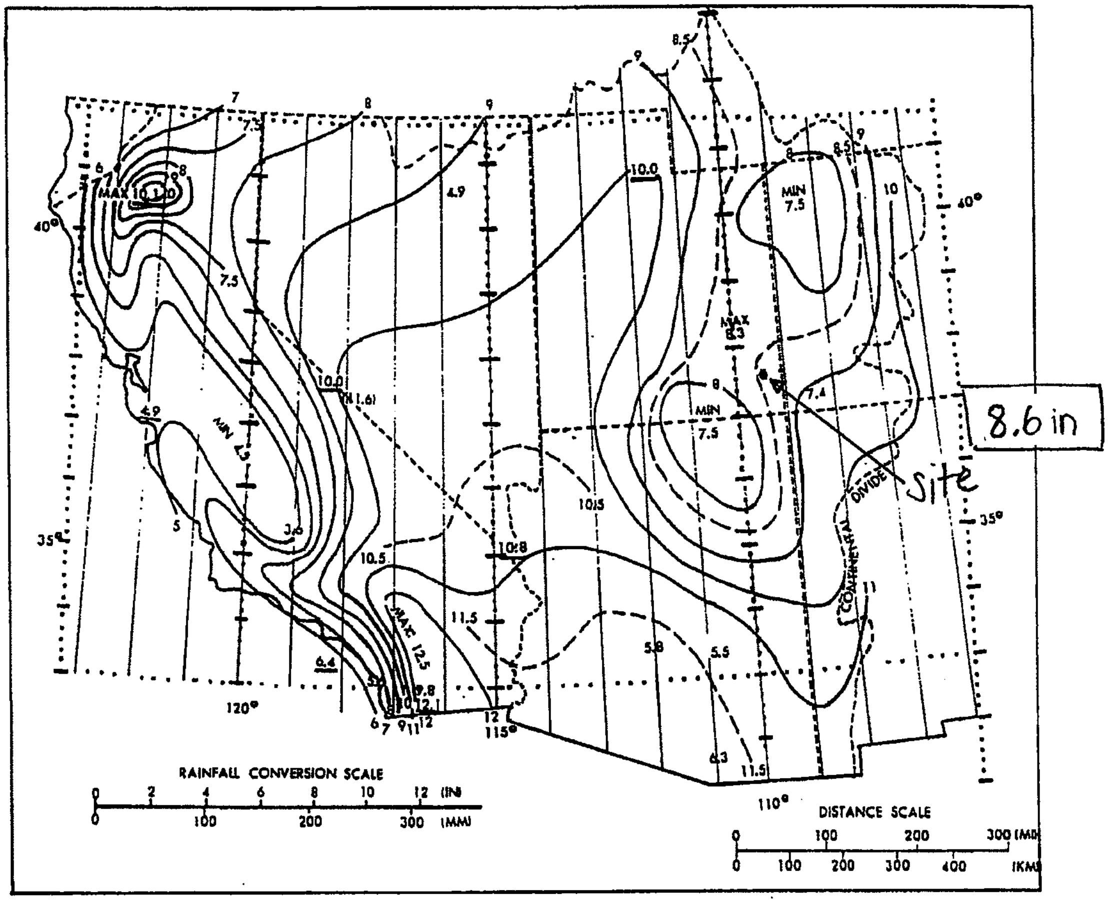

Figure 4.5--Local-storm PMP for 1 mi^2 (2.6 km^2) 1 hr. Directly applicable for locations between sea level and 5000 ft (1524 m). Elevation adjustment must be applied for locations above 5000 ft.

events. In contrast to figure 4.4, figure 4.5 maintains a maximum between these two locations. There is no known meteorological basis for a different solution. The analysis suggests that in the northern portion of the region maximum PMP occurs between the Sierra Nevada on the west and the Wasatch range on the east.

A discrete maximum (> 10 inches, 254 mm) occurs at the north end of the Sacramento Valley in northern California because the northward-flowing moist air is increasingly channeled and forced upslope. Support for this PMP center comes from the Newton, Kennett, and Red Bluff storms (fig. 4.1). Although the analysis in this region appears to be an extension of the broad maximum through the center of the Southwestern Region, it does not indicate the direction of moist inflow. The pattern has evolved primarily as a result of attempts to tie plotted maxima into a reasonable picture while considering inflow directions, terrain effects, and moisture potential.

Attachment A, 1/7

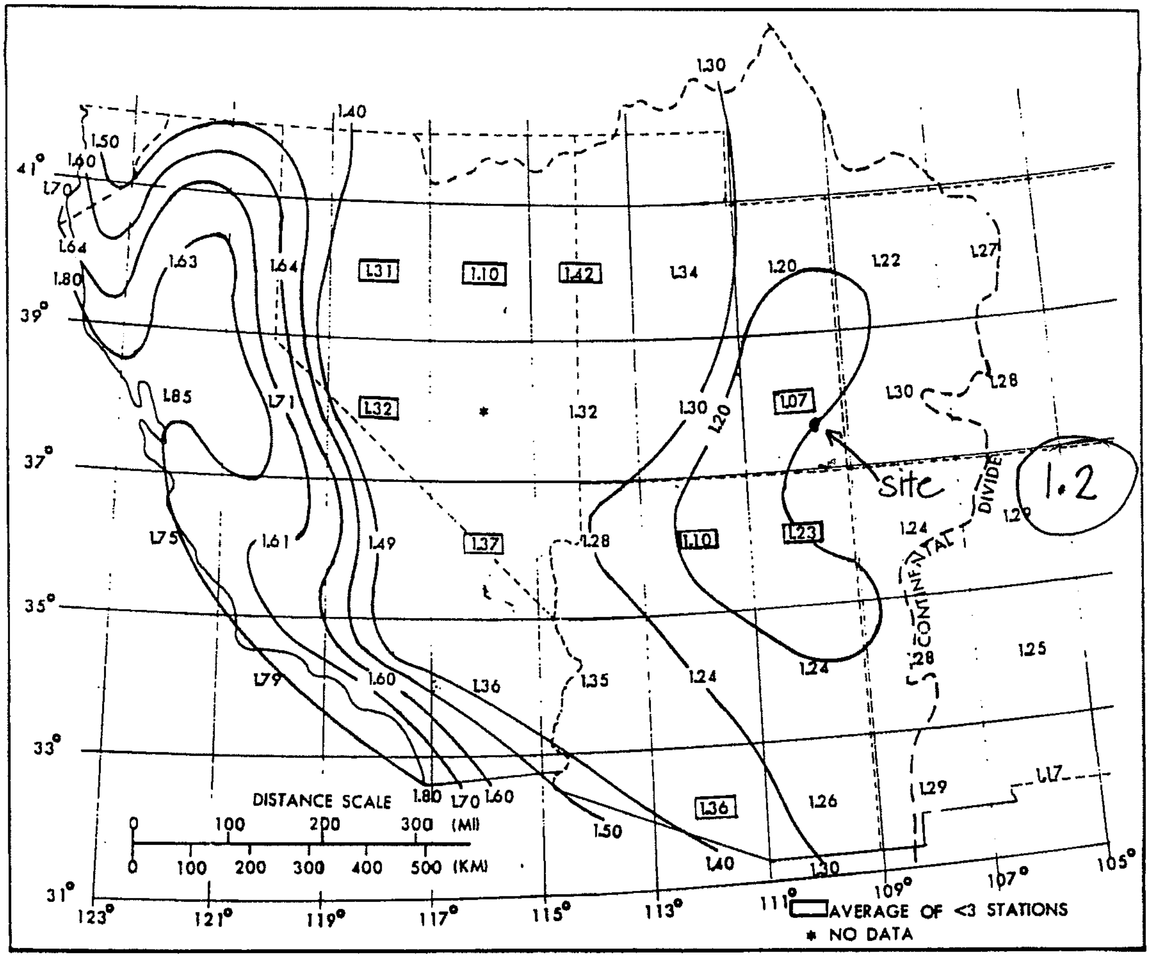

Figure 4.7.--Analysis of 6/1-hr ratios of averaged maximum station data (plotted at midpoints of a 2° latitude-longitude grid).

establish the basic depth-duration curve, then structure a variable set of depth-duration curves to cover the range of 6/1-hr ratios that are needed.

Three sets of data were considered for obtaining a base relation (see table 4.3 for depth-duration data).

a. An average of depth-duration relations from each of 17 greatest 3-hr rains from summer storms (1940-49) in Utah (U. S. Weather Bureau 1951b) and in unpublished tabulations for Nevada and Arizona (1940-63). The 3-hr amounts ranged from 1 to 3 inches (25 to 76 mm) in these events.

b. An average depth-duration relation from 14 of the most extreme short-duration storms listed in Storm Rainfall (U. S. Army, Corps of Engineers 1945-). These storms come from Eastern and Central States and have 3-hr amounts of 5 to 22 inches (127 to 559 mm).

Attachment A, 2/7

ratios than storms with high 3/1-hr ratios. The geographical distribution of 15-min to 1-hr ratios also were inversely correlated with magnitudes of the 6/1-hr ratios of figure 4.7. For example, Los Angeles and San Diego (high 6/1-hr ratios) have low 15-min to 1-hr ratios (approximately 0.60) whereas the 15-min to 1-hr ratios in Arizona and Utah (low 6/1-hr ratios) were generally higher (approximately 0.75).

Depth-duration relations for durations less than 1 hour were then smoothed to provide a family of curves consistent with the relations determined for 1 to 6 hours, as shown in figure 4.3. Adjustment was necessary to some of the curves to provide smoother relations through the common point at 1 hour.

We believe we were justified in reducing the number of the curves shown in figure 4.3 for durations less than 1 hour, letting one curve apply to a range of 6/1-hr ratios. The corresponding curves have been indicated by letter designators, A-D, on figure 4.3. As an example, for any 6-hr amount between 115% and 135% of 1-hr, 1-mi^2 (2.6-km^2) PMP, the associated values for durations less than 1 hour are obtained from the curve designated as "B".

Table 4.4 lists durational variations in percent of 1-hr PMP for selected 6/1-hr rain ratios. These values were interpolated from figure 4.3.

To determine 6-hr PMP for a basin, use figure 4.3 (or table 4.4) and the geographical distribution of 6/1-hr ratios given in figure 4.7.

Table 4.4.--Durational variation of 1-mi^2 (2.6-km^2) local-storm PMP in percent of 1-hr PMP (see figure 4.3)

6/1-hr ratio	Duration (hr) 1/4	1/2	3/4	1	2	3	4	5	6
1.1	86	93	97	100	107	109	110	110	110
✩ 1.2	74	89	95	100	110	115	118	119	120
1.3	74	89	95	100	114	121	125	128	130
1.4	63	83	93	100	118	126	132	137	140
1.5	63	83	93	100	121	132	140	145	150
1.6	43	70	87	100	124	138	147	154	160
1.8	43	70	87	100	130	149	161	171	180
2.0	43	70	87	100	137	161	175	188	200

4.5 Depth-Area Relation

We have thus far developed local-storm PMP for an area of 1 mi^2 (2.6 km^2). To apply PMP to a basin, we need to determine how 1-mi^2 (2.6-km^2) PMP should decrease with increasing area. We have adopted depth-area relations based on rainfalls in the Southwest and from consideration of a model thunderstorm.

Attachment A, 3/7

Attachment A, 4/7

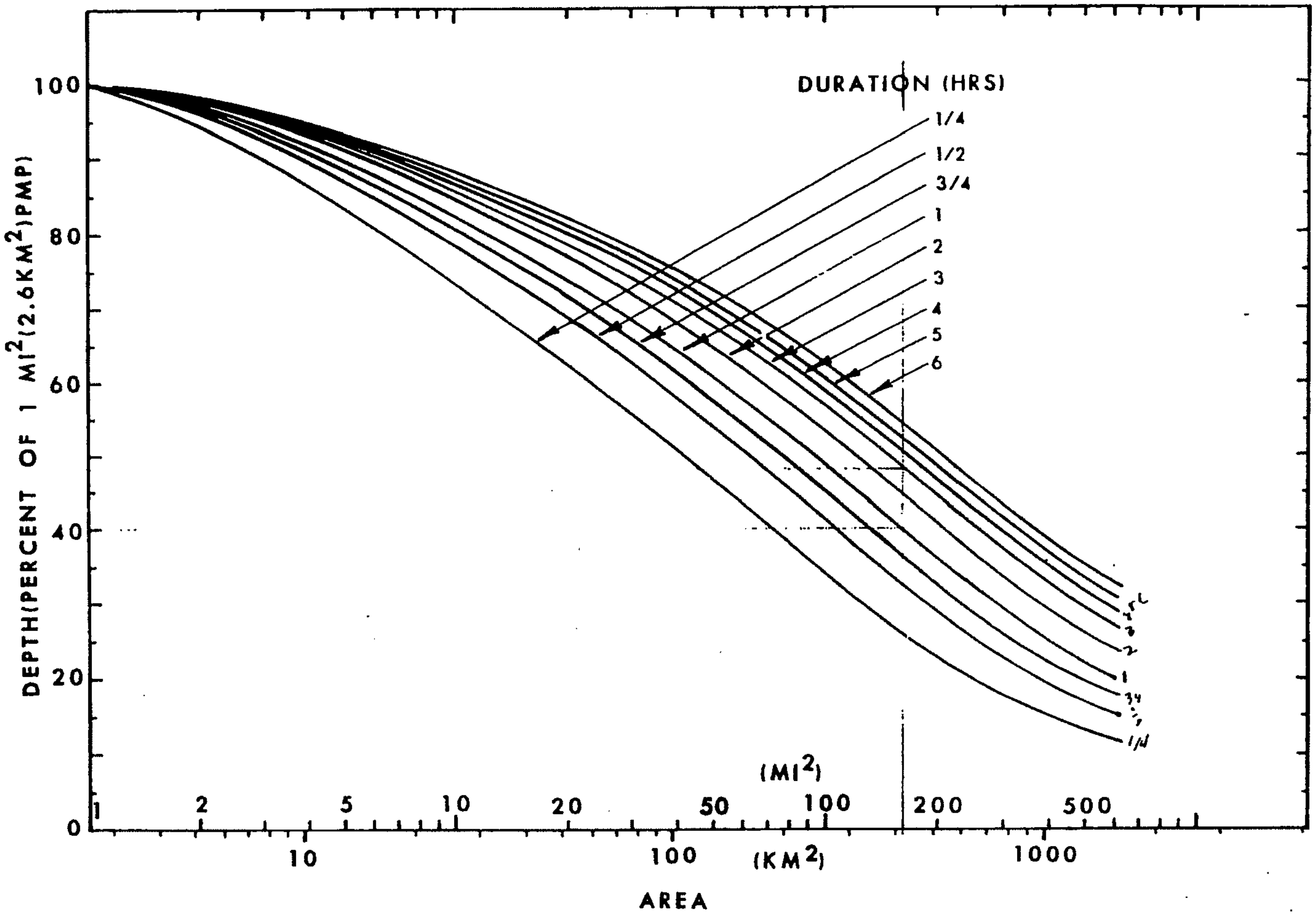

Figure 4.9.--Adopted depth-area relations for local-storm PMP.

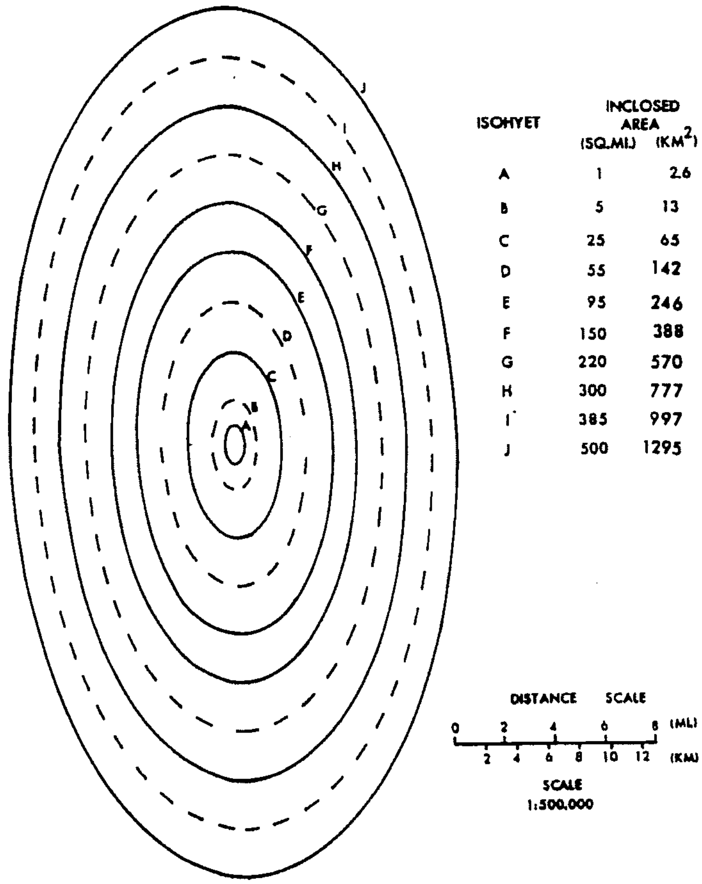

Figure 4.10.--Idealized local-storm isohyetal pattern.

storm period. The sequence of hourly incremental PMP for the Southwest 6-hr thunderstorm in accord with this study is presented in column 2 of table 4.7. A small variation from this sequence is given in Engineering Manual 1110-2-1411 (U. S. Army, Corps of Engineers 1965). The latter, listed in column 3 of table 4.7, places greater incremental amounts somewhat more toward the end of the 6-hr storm period. In application, the choice of either of these distributions is left to the user since one may prove to be more critical in a specific case than the other.

Table 4.7.--Time sequence for hourly incremental PMP in 6-hr storm

Increment	☆	HMR No. 5[1]	EM1110-2-1411[2]
		Sequence Position	
Largest hourly amount	8.3	Third	Fourth
2nd largest	0.8	Fourth	Third
3rd largest	0.5	Second	Fifth
4th largest	0.2	Fifth	Second
5th largest	0.2	First	Last
least	0.1	Last	First

[1]U. S. Weather Bureau 1947.
[2]U. S. Corps of Engineers 1952.

Attachment A, 5/7

Also of importance is the sequence of the four 15-min incremental PMP values. We recommend a time distribution, table 4.8, giving the greatest intensity in the first 15-min interval (U.S. Weather Bureau 1947). This is based on data from a broad geographical region. Additional support for this time distribution is found in the reports of specific storms by Keppell (1963) and Osborn and Renard (1969).

Table 4.8.--Time sequence for 15-min incremental PMP within 1 hr.

Increment	Sequence Position
Largest 15-min amount	First
2nd largest	Second
3rd largest	Third
least	Last

4.8 Seasonal Distribution

The time of the year when local-storm PMP is most likely is of interest. Guidance was obtained from analysis of the distribution of maximum 1-hr thunderstorm events through the warm season at the recording stations in Utah, Arizona, and in southern California (south of 37°N and east of the Sierra Nevada ridgeline). The period of record used was for 1940-72 with an average record length for the stations considered of 27 years. The month with the one greatest thunderstorm rainfall for the period of record at each station was noted. The totals of these events for each month, by States, are shown in table 4.9.

Table 4.9.--Seasonal distribution of thunderstorm rainfalls.

(The maximum event at each of 108 stations, period of record 1940-72.)

	Month						
	M	J	J	A	S	O	No. of Cases
Utah	1	5	9	14	5		34
Arizona		4	16	19	4		43
S. Calif.*		14	10	7			31
No. of cases/mo.	1	23	35	40	9	0	

*South of 37°N and east of Sierra Nevada ridgeline.

Attachment A, 6/7

Table 6.3A -- Local-storm PMP computation, Colorado River, Great Basin and California drainages. For drainage average depth PMP.

Drainage: White Mesa Mill Facility, Cells 2 - 4B — Area 0.39 mi^2
Latitude: N 37° 31' — Longitude: W 109° 30' — Min. Elevation 5598 ft

Step	Description	Value	Unit
1	Average 1-hr 1-mi^2 (2.6-km^2) PMP for drainage [fig. 4.5]	8.6	in.
2a.	Reduction for Elevation. [No adjustment for elevations up to 5,000 feet: 5% decrease per 1,000 feet above 5,000 feet.	0.97	%
b.	Multiply step 1 by step 2a.	8.3	in.
3.	Average 6/1-hr ratio for drainage [fig 4.7]	1.2	

Step	Description	1/4	1/2	3/4	1	2	3	4	5	6	
		Duration (hr)									
4	Durational variation for 6/1-hr ratio of step 3 [table 4.4]	74	89	95	100	110	115	118	119	120	%
5	1-mi^2 (2.6 km^2) PMP for indicated durations [step 2b x step 4]	6.1	7.4	7.9	8.3	9.1	9.5	9.8	9.9	10.0	
6	Areal reduction [fig. 4.9]	100	100	100	100	100	100	100	100	100	%
7	Areal reduced PMP [steps 5 x 6]	6.1	7.4	7.9	8.3	9.1	9.5	9.8	9.9	10.0	in.
8	Incremental PMP [successive subtraction in step 7]				8.3	0.8	0.4	0.2	0.1	0.1	in.
		6.1	1.2	0.5	0.4	} 15-min. increments					
9	Time sequence of incremental PMP to: Hourly increments [table 4.7]				0.1	0.4	8.3	0.8	0.2	0.1	in.
						Total depth of 6 hour storm				**9.9**	**in.**
	Four largest 15-min increments [table 4.8]				6.1	1.2	0.5	0.4	in		
					Total depth of 1st hour of storm					**8.3**	**in.**