0013

Hidden Splendor Resources
Horizon Mine
P.O. Box 32, Helper, Utah 84526
Phone: (435) 472-1313 – Fax: (435) 472-1314

May 27, 2004

Ms. Pamela Grubaugh-Littig
Utah Coal Program
Utah Division of Oil, Gas and Mining
1594 West North Temple – Suite 1210
Box 145801
Salt Lake City, UT 84114-5801

Incoming
C/007/0020
1933

Re: Hidden Splendor Resources, Inc.
Horizon Mine
C/007/0020
Chapter 7 – Pages 47 through 52

Dear Pam:

Pursuant to my telephone conversation last week with Dave Darby, enclosed please find 5 copies of Chapter 7, pages 7-47 through 7-52 to replace the previously submitted pages.

Due to a printing error, the formulas and calculations did not print on these pages. The information is contained in the electronic file for Chapter 7.

We apologize for any inconvenience this may have caused.

If you have any questions or comments, please feel free to contact me at 435-472-0431.

Sincerely,

Kit Pappas

Kit Pappas
Engineering/Environmental

JUN 0 1 2004

cc: File

APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: HIDDEN SPLENDOR RESOURCES, INC.
Mine: HORIZON MINE **Permit Number:** C/007/020
Title: REPLACEMENT OF CHAPTER 7 PAGES 7-47 THROUGH 7-52
Description, Include reason for application and timing required to implement:

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: _____ ☐ increase ☐ decrease.
☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO#
☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes ☒ No 6. Does the application require or include public notice publication?
☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV #
☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes ☒ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
☐ Yes ☒ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes ☒ No 19. Does the application require or include certified designs, maps or calculation?
☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

DERREL CURTIS
Print Name

Derrel Curtis General Mgr. 5/27/04
Sign Name, Position, Date

Subscribed and sworn to before me this 27 day of MAY, 2004

John C Pappas
Notary Public

My commission Expires: MARCH 7, 2006 }
Attest: State of UTAH } } ss:
County of CARBON

JOHN C. PAPPAS
NOTARY PUBLIC • STATE of UTAH
1646 E. CASTLE CIRCLE
PRICE, UTAH 84501
COMM. EXP. 3-7-2006

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		JUN 0 1 2004

Form DOGM- C1 (Revised March 12, 2002)

APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: HIDDEN SPLENDOR RESOURCES, INC.
Mine: HORIZON MINE **Permit Number:** C/007/020
Title: REPLACEMENT OF CHAPTER 7 PAGES 7-47 THROUGH 7-52

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐ Add	X Replace	☒ Remove	CHAPTER 7 PAGES 7-47 THROUGH 7-52
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	Received by Oil, Gas & Mining JUN 0 1 2004 DIV. OF

Form DOGM - C2 (Revised March 12, 2002)

Sedimentation control structures and diversions will be installed using the best technology currently available. Silt fence fabric and wire mesh (when used) will be buried in a trench on the upstream side of the silt fence. The depth of trench will vary, however an attempt will be made to use 6" as a standard depth. When silt fence is installed in a channel the silt fence will be installed flush with the sides and top of the channel to prevent seepage from occurring around the fence. The fence will be constructed parallel to the contours of the slope, with the ends bent upslope. The type, height, and width will be analyzed on a case by case basis to determine the best technology to be used for each situation.

Straw-bales will be installed in a trench the width of the bale (when weather conditions permit) and the length of the proposed sediment structure. The soil from the excavated trench will be placed against the bales. Straw-bales will be secured with a minimum of two stakes inserted into the bales and extending a depth sufficient to securely anchor the straw-bale into the ground. The structure will be constructed parallel to the contours of the slope, with the ends bent upslope. Loose straw will be wedged into gap spaces.

Installation of the culverts will proceed from the lower end of the pad area in an upstream direction. To the extent possible, Horizon Coal Corporation will limit construction activities associated with culvert installation to those periods when the stream is not flowing. Alternatively, stream flow will be bypassed around construction activities within the channels. The sedimentation pond will be constructed as soon as practical following installation of the culvert.

Methodology

The following methods were used to determine runoff volumes and peak flows for design of diversions, culverts, and the sedimentation pond:

Determination of Precipitation Depth. Precipitation depths were determined for the 10-year, 6-hour; 10-year, 24-hour; 25-year, 6-hour; and 100-year, 6-hour storms using data developed by Miller, et al. (1973). The precipitation depths for these events are 1.5 inches, 1.8 inches, 1.6 inches, and 1.8 inches, respectively.

Determination of Runoff Volume. The SCS curve number method was used to determine the runoff volume resulting from the design precipitation events. According to this method (U.S. Soil Conservation Service, 1972), the algebraic and hydrologic relations between storm rainfall, soil moisture storage, and runoff can be expressed by the equations:

and

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S} \quad \textbf{(3)}$$

$$S = \frac{1000}{CN} - 10 \quad \textbf{(4)}$$

where Q = Direct runoff volume (inches)
S = Watershed storage factor (inches)
P = Rainfall depth (inches)
CN = Runoff the curve number (dimensionless)

It should be noted that (a) Equation (3) is valid only for P >= 0.2S (otherwise Q = 0), (b) Equation (4), as stated, is in inches, with the values of 1000 and 10 carrying the dimensions of inches, although metric conversions are possible, and (c) CN is only a convenient transformation of S to establish a scale of 0 to 100 and has no intrinsic meaning.

Curve numbers for the watersheds of concern were obtained by evaluating the watershed surface characteristics based on soils, vegetative type, and other characteristics. This determination was based on maps and field reconnaissance of the site. The curve numbers for undisturbed areas were determined using the estimated cover density of the vegetative community and tabulated values provided by the U.S. Soil Conservation Service (1986), assuming hydrologic soil groups B and C (as is typical of much of the region). For the disturbed areas, curve numbers were chosen from professional judgement and tabulated values presented by the U.S. Soil Conservation Service (1972).

Weighted-average curve numbers were determined based on the percentage of each watershed occupied by a given land type. Antecedent Moisture Condition II was used for all runoff estimates.

Hydrograph Synthesis. Runoff hydrographs were developed, for the storm events, using the SCSHYDRO computer program, originally developed by Hawkins and Marshall (1980), modified to add additional rainfall distributions and allow batch file processing. The SCSHYDRO program was designed to simulate the surface runoff response of a drainage to precipitation, using the SCS triangular hydrograph method.

The SCS method yields a total rainfall excess, the difference between rainfall depth and precipitation loss. For a given storm, the incremental excess for a given time period of a storm can be computed as the difference between the accumulated excess at the end of the current time period and the accumulated excess at the end of the previous period (U.S. Soil Conservation Service, 1972). The computer program calculates the incremental volume using:

$$\Delta Q = \left(\frac{(P(t + \Delta t) - 0.2S)^2}{P(t + \Delta t) + 0.8S} \right) - \left(\frac{(P(t) - 0.2S)^2}{P(t) + 0.8S} \right) \quad \textbf{(5)}$$

where S is as previously defined and values for $P(t+\Delta t)$ and $P(t)$ are determined from the rainfall mass curve.

This rainfall excess is then translated to an outflow hydrograph using the SCS triangular dimensionless unit hydrograph (U.S. Soil Conservation Service, 1972). The unit hydrograph shown in Figure 7-6 is a typical curvilinear hydrograph. It is characterized by its time to peak (T_p), recession time (T_r), time of base (T_b), and the relations between these parameters (i.e., $T_r = 1.67T_p$; $T_b = 2.67T_p$). Thus, from the geometry of a triangle, the incremental runoff (ΔQ can be defined by the equation:

$$q_p = \frac{0.75\ \Delta Q}{T_p} \quad \textbf{(6)}$$

where q_p = Peak flow rate (in/hr, if Q is in inches and T_p in hours)

and other parameters previously defined.

The flow at any time $0 < t < T_r$ may be determined by simple linear proportioning of the triangular unit hydrograph. The time to peak is related to the familiar expression "time of concentration" (T_c) by the equation:

$$T_c + \Delta t = 1.7\ T_p \qquad \textbf{(7)}$$

in which the factor 1.7 is an empirical finding cited by the U.S. Soil Conservation Service (1972).

The time of concentration may be estimated by several formulas. For this document, T_c was determined from the following equations (U.S. Soil Conservation Service, 1972):

figure 7-6

and $$L = \frac{\lambda^{0.8}\ (S+1)^{0.7}}{1900\ Y^{0.5}} \qquad \textbf{(8)}$$

$$T_c = 1.67\ L \qquad \textbf{(9)}$$

where L = Watershed lag time (hours)
λ = Hydraulic length of the watershed, or distance along the main channel to the watershed divide (feet)
S = Watershed storage factor defined in Equation (4)
Y = Average watershed slope (percent)
T_c = Time of concentration (hours)

The U.S. Soil Conservation Service (1972) shows that Δt must equal $0.2T_p$. Hence, the computer code uses only T_c, and from this value computes Δt, T_p, T_r, and interim unit hydrograph ordinates. To convert the unit hydrograph ordinates to cubic feet per second, the following relation is used:

$$q_{cfs} = q_{\frac{inch}{hr}} * 645.33 * Area \qquad \textbf{(10)}$$

where Area =Drainage area (square miles)
q = Discharge (cubic feet per second)

<u>Channel Hydraulics</u>. The capacity of the undisturbed and disturbed area diversion channels, at the design flow rate, was determined using the FlowMaster I™ program developed by Haestad Methods (1990). This program solves for prismatic channel capacity using the Manning equation:

and the continuity equation:

$$Q = A*V \qquad \textbf{(11)}$$

where V = Velocity (feet per second)
R = Hydraulic radius (feet)
S = Hydraulic slope (feet per foot)
n = Manning's roughness coefficient
Q = Discharge (cubic feet per second)
A = Flow area (square feet)

$$V = \frac{1.486}{n} * R^{2/3} * S^{1/2} \quad \textbf{(12)}$$

Channel parameters required for the solution of Equations (11) and (12) were obtained from design cross sections and the proposed longitudinal profile of the various channels. Values of the roughness coefficient were obtained by comparing proposed conditions with tabulated values provided by Chow (1959) and the U.S. Soil Conservation Service (1956).

For the design of the undisturbed area diversions and the reclaimed channels, a maximum permissible velocity of 5 feet per second was determined to be non-erosive. This was determined from Barfield, et. al. (1981) based on a graded loam soil with gravel for sediment laden flows.

Undisturbed Area Runoff Control

General. Runoff from the undisturbed area upstream of the surface facilities in Portal Canyon and Jewkes Creek will be diverted beneath the mine facilities via three culverts. The culverts are designed as temporary structures for the life of the facility and will be removed following the operations. The undisturbed-area culverts are sized to pass the peak flow resulting from the 100-year, 6-hour precipitation event. Calculations supporting these designs are presented in Appendix 7-4. A copy of the stream alteration permit from the Utah Division of Water Rights required for installation of the undisturbed-area culverts is included in Appendix 7-12.

Diversions. The bypass culverts are sized to safely pass the peak flow resulting from the 100-year, 6-hour precipitation event. Plate 7-5 shows the location of the culverts and the drainage area to each structure, respectively.

Undisturbed area culvert UC-1 will bypass drainage runoff from culverts UC-2 and UC-3 (i.e., Portal Canyon and Jewkes Creek, respectively). The combined 100-year, 6-hour peak flow from these drainages is 27.9 cfs. The culvert to be installed in this section of the drainage will have a diameter of 36 inches, based on the minimum slope section and open-channel flow conditions for the culvert.

Culvert UC-2 will receive runoff from Portal Canyon. The 100-year, 6-hour peak flow for this culvert is 8.3 cfs. A 24-inch diameter culvert is planned to be installed at this location. This size is based on inlet control and a headwater to depth ratio of one or less. A trash rack will be installed on the inlet to this culvert, as indicated in Figure 7-8.

Culvert UC-3 will receive runoff from Jewkes Creek. The 100-year, 6-hour peak flow to this culvert is 19.6 cfs. This flow can adequately be handled by a 30-inch diameter culvert, based on inlet control and a headwater to depth ration of one or less. An extension of UC-3 is discussed in Appendix 3-9.

Discharge at the outlet of culvert UC-1 will have an exit velocity of approximately 10.4 fps (see Appendix 7-4). This will be controlled by installing an outlet channel and impact pool. The outlet channel will have graded riprap on the bottom and along the sides of the channel for an