



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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**TO:** Division Hydrologists

**FROM:** Rick P. Summers, Senior Hydrologist *RS*

**RE:** Outline for Position Paper on Design Storm Event Criteria Relative to Diversion Designs

## SUMMARY

As we discussed in our meeting of December 10, 1991, the design event criteria set forth in Rules R645-301-742.320 and R645-301-742.330 needs clarification to ensure consistent application of the rules and our reviews. Specifically, it was decided to develop a position paper to be used as a working guideline in the preparation of applications by the Operators and for our reviews. The concern is in the application of Rule R645-301-742.333 which specifies design event criteria for diversions of miscellaneous flows. The rule allows the use of a 2 yr. - 6 hr. precipitation event in the design work.

This memo proposes an outline and approach for the development and use of this position paper. The Division's concern is that the design of diversions using the 2 and 10 yr. event criteria of 742.333 for operational diversions will result in diversion failures. Operational diversions will largely be installed, maintained and relied upon during the entire life of mine. Such failures could jeopardize pond performance and safety, increase sediment loading to the pond, and potentially cause off-site increases in sediment loads. It is felt that the approval of such designs is actually a disservice to the Operator in terms of increased enforcement liability and diversion maintenance costs and to the public in terms of protection of the hydrologic balance.

The following is a proposed outline for the position paper. Following each topic, comments are made as to the anticipated content and/or approach for the preparation of the document. Please review the outline, make suggestions, and indicate to me the section(s) you prefer to be involved with in the preparation of the paper.

## **Guideline Diversion Design Event Criteria**

### **I. Statement of Rules**

This section will simply be a restatement of the applicable rules to facilitate reader interpretation of the guideline.

### **II. Legislative History and Rule Intent**

This section will review the Act, the Federal Register record, and results of a COLEX search. The discussion will emphasize that the 2 year design standard is not a new rule, it has always been in the rules (i.e., "old rules").

### **III. Technical Discussion**

#### **a) Probability Theory and Utah Diversions**

The objective of this section will be to present the probability of structure failure for different design events under "typical" Utah diversion design life. Basis of theory and results.

#### **b) Sensitivity Analysis of Different Design Event Criteria and Peak Flows**

This section will present peak flow values using the 2 yr., 10 yr., 25 yr. and 100 yr. precipitation events for typical disturbed area diversions and undisturbed area bypass diversions. The objective is to demonstrate the expected low peak flows using the 2 yr. criteria and emphasize higher risk associated with that criteria.

#### **c) Impact of Different Design Event Flows on Channel Size.**

The objective of this section will be to present typical channel sizes required for the events summarized in section b). Emphasis will be on the relatively reasonable size for constructed diversions to pass the more stringent (i.e., 10 year) criteria.

### **IV. Division Approach to Diversion Design Approval**

This section will discuss the philosophy of surface mining "temporary diversions" vs. underground mining operational diversions. The discussion will include benefits of the more stringent criteria to the Operator in terms of reduced

enforcement liability and maintenance costs and to the public in protection of the hydrologic balance. Bond release ramifications will be addressed.

The discussion will emphasize that the Division will approve the use of 2 yr. criteria for diversions that are temporary in nature (i.e. 1-2 year installed life). The Division is not disallowing the use of this rule, it does have merit and intent for specific cases. Discussion will include and emphasize the Division's past practice with regard to this criteria ("old rules") and procedurally, permitting will not change.

#### **V. Regulatory Authority**

This section will discuss the regulatory authority for the Division action. The discussion will include the rules with language such as "as determined by the Division" to justify the use of the 10 year return period design standard.

#### **VI. Summary of Western States Coal Regulatory Program Diversion Design Requirements**

It is hoped that this section will not only provide surrounding State program rules, but will also document the practices and working interpretation of those rules by those hydrologists currently involved with these rule responsibilities.

#### **VII. Summary of Diversion Design Event Criteria Currently Used by Coal Operators in Utah**

This section will summarize current design criteria and diversion design contained in our approved MRP documents. The section will demonstrate that most, if not all Operators, are currently using the 10 year return period standard for the design criteria. The section is envisioned to be a table of current operations with approved design criteria used for both operational and final reclamation diversion designs.

cc: L. Braxton  
P. Grubaugh-Littig  
D. Haddock

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