

**Application Guidelines
for
Additional Information Requirements
for sites that are:**

on Floodplains

on Steep Slopes

in Hydrologically Sensitive Areas

If the mine proposal possesses any of the characteristics described for any category of operation listed on the following pages, additional information regarding the specific issue *may be required*. The type of information or data gathering which may be required is also described. A pre-application conference at the site may be needed. Data collection and analysis techniques should be coordinated with the MLR reclamationist.

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CHARACTERISTICS AT SITES WITH STEEP SLOPES

Sites with down slope risk to waters of the state

1. Loading or unloading on slopes >60%
 - a) Where fills are greater than 2 vertical feet
 - b) Where cuts are in excess of 20 vertical feet
2. Loading or unloading on steep slopes 30% to 60%
 - a) Where fills of waste rock, overburden, or soil are deeper than 25 vertical feet
 - b) Where cuts are in excess of 100 feet in rock and/or 20 vertical feet in soils steeper than 1 1/2:1 (h:v)
3. Overburden, waste, or reject rock storage or dump construction on moderate slopes, <30% and >15%
 - a) Where fills of waste rock, overburden, or soil are deeper than 25 feet
 - b) Where any storage within 300 feet of a stream is proposed

Sites with high probability of failure

4. Geomorphic stability

Site possesses ancient landslide features or a predisposed weakness

5. Unconsolidated or poorly consolidated deposits that will be mined and left as deep water filled pits within 500 feet of an external property line

Information That May Be Required

The scope of the required information will be based on site characteristics and project scale. If either down slope risk or the probability of failure is high, a written plan may be required to explain how the resource will be protected. Information required may range from:

1. A report describing pre-existing conditions identifying slumps, mid-slope benches, hummocky terrain, springs and ancient landslide features.
2. A written plan that demonstrates protection of the resource which includes geotechnical mitigation such as a drainage blanket or other method of stabilizing fills on slopes.
3. A geotechnical investigation and design by a geotechnical engineer or engineering geologist.

CHARACTERISTICS OF SITES ON FLOODPLAINS

1. Mining deeper than the bottom of the channel

Where an operation within the 25-year flood boundary is proposed

2. Inherent geomorphic instability of the river system or the local reach
 - a) Where existing site conditions suggest stream bank instability
Includes physical condition of the banks and consideration of management and health of the riparian zone
 - b) Where historical geomorphic instability exists
 - c) Where there is potential to impact off-site structures such as bridge abutments or irrigation diversion points
 - d) Where natural features, man-made structures or other modifications to the river system affect river or floodplain stability
3. Subject to flooding
 - a) Where there is evidence that high flow velocities will occur during flooding over or adjacent to the site
 - b) Operations larger than 100 acres subject to flooding during a 100-year event
4. Where in-stream extraction in excess of 5,000 yards is occurring within one river mile of the proposed site

Information That May Be Required

The scope of the required information will be based on site characteristics and project scale. If the project has the potential to cause accelerated erosion, channel avulsion or impacts to water quality and fisheries a written plan may be required. The plan should provide evidence through the use of geometrical controls (such as maximum cutslope angles and mine depth restrictions), engineered structures and/or setbacks from the channel that the system balance will not be altered. Furthermore, the plan should identify measures to protect river channel and floodplain integrity. The information required may range from or include:

1. Historic air photos, bank line interpretation and analysis of geomorphic trends.
2. Site hydrology including flow duration, magnitude and frequency of flooding.
3. Bed and bank sediment samples and an evaluation of the erosional stability of the buffer strip.
4. Sediment transport data for the main channel and off channel areas of frequently flooded sites.
5. Channel and floodplain hydraulics (water surface elevations, channel bed and bank velocities).
6. Documentation of existing conditions and structures adjacent to the site. Documentation of adjacent land uses. Provide analysis of upstream and downstream impacts of the proposed mining activity to these adjacent conditions, structures and land uses.

CHARACTERISTICS OF SITES IN HYDROLOGICALLY SENSITIVE AREAS

1. The proposed site is in or within one mile of critical groundwater area, a groundwater limited area or an area of groundwater restricted classification
2. De-watering or mining operations may impact adjacent users (wells or springs) or rivers and streams
3. The site is underlain by multiple aquifers or complex hydrogeology
4. The proposed depth of mining may impact or breach a confining layer

Information That May Be Required

The scope of the required information will be based on site characteristics and project scale. If the project has the potential to impact water quality or quantity of a legal user a written plan may be needed. This written plan should provide evidence through data collection and analysis, mine plan restrictions, and/or mitigation that the planned activity will not adversely affect other groundwater users. Information required may range from or include:

1. Identification, review and submittal of adjacent well logs. Their location must be provided on a suitable map.
2. Inventory of adjacent water rights and water use.
3. Measure static water levels in adjacent wells and survey in well head locations if area has low relief.
4. Determination of the current potentiometric surface.
5. Drilling data and completion from one to numerous observation wells. Definition and/or delineation of presence/absence of confining bed(s).
6. A groundwater monitoring program during mining.
7. Development of an area groundwater budget and projection of mining impacts thereon.