STORM DRAINAGE REPORT
AMENDED MINING PERMIT #77-184
MOBILE PREMIX COMPANY
FORT COLLINS, COLORADO

ADDENDUM TO:
FINAL STORM DRAINAGE REPORT
CACHE LA PoudRE INDUSTRIAL PARK
FORT COLLINS, COLORADO (DEC 1986)

John R. Clark P.E.
Consulting Engineer
Fort Collins, Colorado
March 21, 1988
1. Scope

The study area of this report is in the northeast 1/4 of section 18, Township 7 North, Range 68 West in the City of Fort Collins, Colorado. It is covered by thick grasses and old abandoned farm structures; it contains 6 acres more or less. It is in the flood plain of the Cache La Poudre River, further described in Exhibit 1 and 2.

The purpose of the report is to supplement basic work done in the Final Storm Drainage Report, Cache La Poudre Industrial Park, and Piken-Riverside Storm Drain of December 1986. The additional study area shall be an extension of the existing Mobile Premix Company. The report addresses drainage considerations on the subject parcel.

2. Site Investigation and Soils Considerations

The site is relatively flat but has a bluff rising to the west and south. Soils are free draining sands and gravels overlain by 1 to 3 feet of loam and organic overburden. The area will be used for gravel extraction.

3. Drainage Considerations and Computations

Minor Storm System. The minor storm system consists of overland flow from onsite and on-site runoff into the gravel extraction areas. The contributing drainage basin of about 9 acres of pasture land contains a length of 800 feet, a slope of 2.6 percent and an assumed runoff coefficient of 0.2. Design storm period of 10 years is used. Resulting flowrate is 4.7 cfs using the rational method. See Exhibit 3.

Major Storm System. The major storm is a 100 year return period. This is not analysed because the parcel is in the flood plain. Runoff from upslope is not significant in comparison to the flood plain considerations.

4. Provisions for Site Drainage

The erosion control improvements shall be made as required by Mobile Premix prior to and during the extraction operations. The extraction permit requires mitigation of operations and restoration of the site, including slope repair and stabilization. The 5 foot levee referred to in the Mobile Premix mining permit amendment is not considered; discussion with submitting parties indicates that it would not be in the public interest to construct such a levee at the present time.

The safety considerations due to the flood hazard are that no habitable structures will be erected on the site. Mobile machinery will be used in the operations. No utility improvements are planned for the site. Construction and maintenance of higher ground levels at the south end of the parcel which adjoins the Industrial Park to a minimum elevation of 4922
will minimize flooding threats to the Industrial Park from high waters of the flooding Poudre River. Detention in the excavation area will mitigate hazards from flooding due to localized storm runoff of lesser storms.

Although no current watertable information is available, it is estimated that natural watertable may fluctuate around the 4910 level based upon observation of the immediate area. Since natural ground is currently at 4916 to 4919, on-site detention capacity will be considerable.

Should habitable structures be considered for this site in the future, further study is recommended. However, based upon Exhibit 2, preliminary foundation elevation of such structures should exceed elevation 4924 to meet current standards.

5. Engineers Certification

I hereby certify that this report for the drainage design of the subject 6 acre parcel was prepared by me for the owners thereof and meets or exceeds the criteria in the City of Fort Collins Storm Drainage Design Criteria of May 1984.

[Signature]
John R. Clark P.E.
Coio No. 13740
March 21, 1988

Attachments: Exhibit 1 Vicinity Map
Exhibit 2 FIRM Map Larimer County of March 1986 (portion)
Exhibit 3 Storm Drainage Preliminary Design Data Form 11-3
<table>
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<tr>
<th>Location of Design Point</th>
<th>Street Length</th>
<th>Street Flow Time</th>
<th>Street Peak Flow</th>
<th>Street Time of Concentration</th>
<th>Street Coefficient</th>
<th>Street Area</th>
<th>Street Direct Runoff</th>
<th>Street Overland Runoff</th>
<th>Street Slope</th>
<th>Street Allowable Capacity</th>
<th>Pipe Slope</th>
<th>Pipe Size</th>
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**SW PROP LINE**

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OVERRIDE, OFFSITE