

**Permitting of Wastewater Discharges**  
**from**  
**Biodiesel Production Facilities in Colorado**

Presentation at

*A Biodiesel CO-OPS Conference*  
***“Strategies for Community-Based Biodiesel Groups”***

<http://www.collectivebiodiesel.org/>

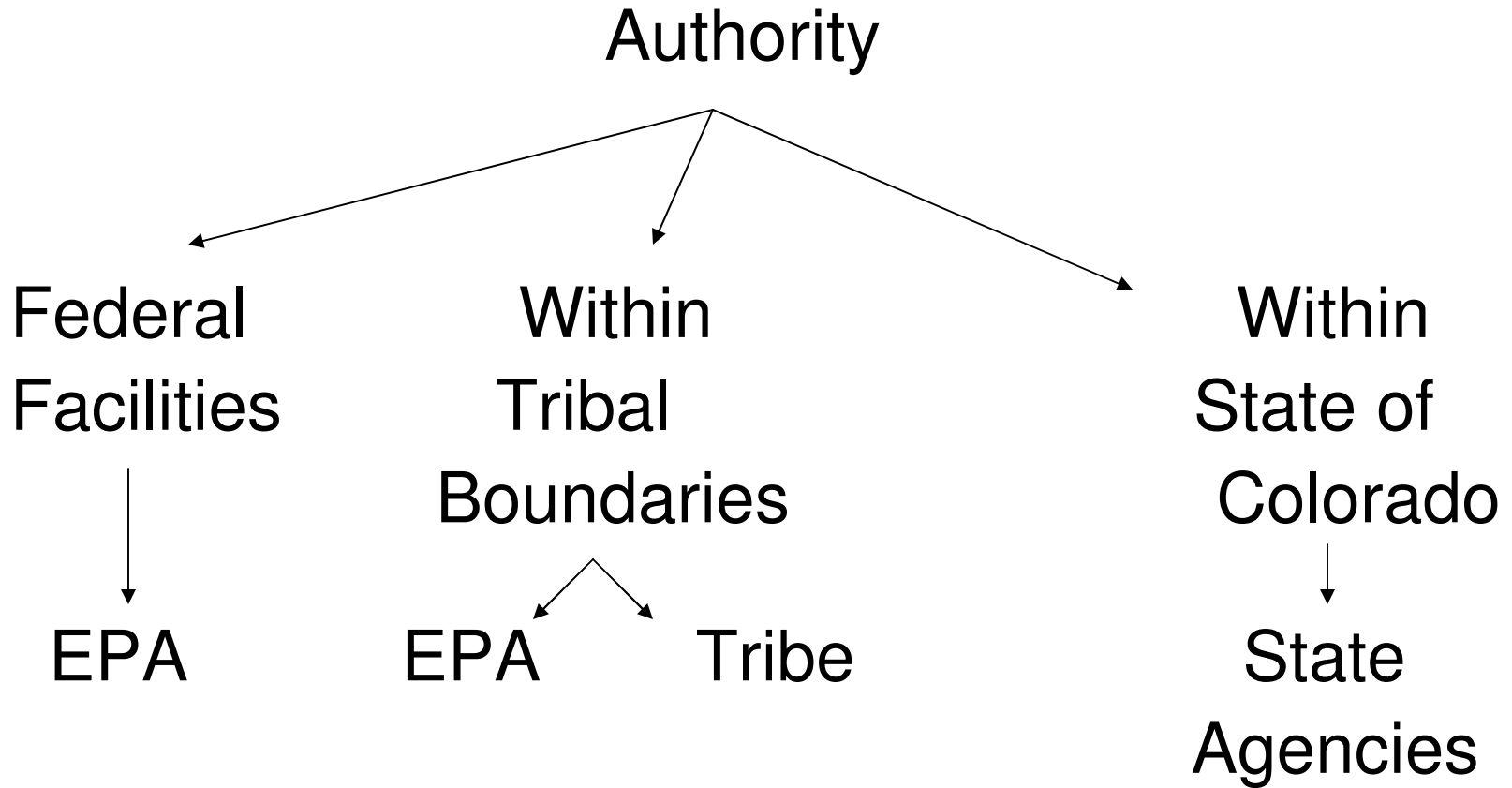
Hosted by the Student Council on Sustainability at the Colorado School of Mines

July 13 - 15, 2007

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Industrial Permits Unit (Permits Section)  
Water Quality Control Division  
Colorado Department of Public Health and Environment  
Denver, Colorado

<http://www.cdphe.state.co.us/wq/PermitsUnit/index.html>

# Jurisdiction



# Discharge to Surface Waters

Release to natural drainage systems  
or man-made conveyance systems

(including alluvial groundwaters  
and excluding waters withdrawn  
for use)



WQCD Permit

# Discharge to Groundwaters

Injection Well



EPA  
UIC Permit

Unlined Pond



WQCC sets WQ standards and  
implementing agencies can issue  
permits (SB 89-181, 1990)



Hazardous Materials and Waste Management Division  
CO Oil and Gas Conservation Commission  
CO Department of Natural Resources (DMG)  
State Engineer's Office  
Division of Oil and Public Safety  
Water Quality Control Division (WQCD)

Land Disposal



# Types of WQCD Discharge Permits

## **General Permits**

Category of dischargers or dischargers within a geographical area.

Certification issued to each discharger

## **Individual Permits**

Individual discharger

Usually flow greater than 1 MGD and/or high risk of toxic pollutants

Permit issued to each discharger

# Types of Individual Permits

## **Stormwater (6)**

### Municipal

4 cities and  
CDOT

### Industrial

DIA

## **Process Water (430)**

### Domestic

surface water (230)

groundwater (100)

### Industrial

surface water (90)

groundwater (10)

# Types of General Permits

## **Stormwater (5,555)**

Construction (3723)  
Sand and Gravel (465)  
Light Industries (706)  
Heavy Industries (154)  
Mining Industries (77)  
Recycling Industries (103)  
MS4 Phase II (116)  
NO Exposure (183)

## **Industrial Process Water (1,146)**

Construction Dewater (156)  
Sand and gravel (633)  
Coal Mining (15)  
Coalbed methane (13)  
Water Treatment (80)  
Water Distribution (9)  
Groundwater Remediation (21)  
Minimal Industrial (218)  
Aquatic Production (13)

# Establishing Effluent Limits

## **Technology-based Limits**

**Federal** – Effluent Limitation Guidelines (ELG) based on processes.

**State** – secondary treatment requirements (TSS, BOD, pH, oil grease)

## **Water-quality-based Limits**

**State** – How much additional load can stream receive without concentration exceeding water quality standard. Use reasonable potential analysis. Also, certain waters need additional protection under antidegradation review

**Select most stringent as effluent limit**

(can require additional monitoring for reasonable potential analysis)



# Water Pollutants of Concern from Biodiesel Plants

## Process

feedstock (vegetable oils, used cooking oil)

plus

alcohol (methanol), strong base (sodium hydroxide)

## Wastewater

Fatty acids ( = BOD)

Residual alcohol ( = BOD)

Organic by-product – glycerin (= BOD)

Residual strong base (= high pH)

## Disposal

Discharge to surface waters

Discharge to ground waters

# Alta Energy - Monte Vista, Colorado

**Application for discharge permit** – June 27 2006

**Industry** - makes biodiesel from vegetable oil

- annually produces -12 million gallons of 100% biodiesel (B100)
- 2.6 million gallons of glycerin

**Discharge flow** - Intermittent discharge - 3X/day for 15 minutes at 140 gal/minute

- operation -12 mos, 5 days/week, 8 hrs/day
- average 0.0044 MGD with max of 0.0094 MGD

**Chemical additions** - methanol, sodium hydroxide, and phosphoric acid

- no reason to expect priority or other pollutants present
- biodiesel has a low toxicity (lower than table salt) and biodegrades faster than refined cane sugar

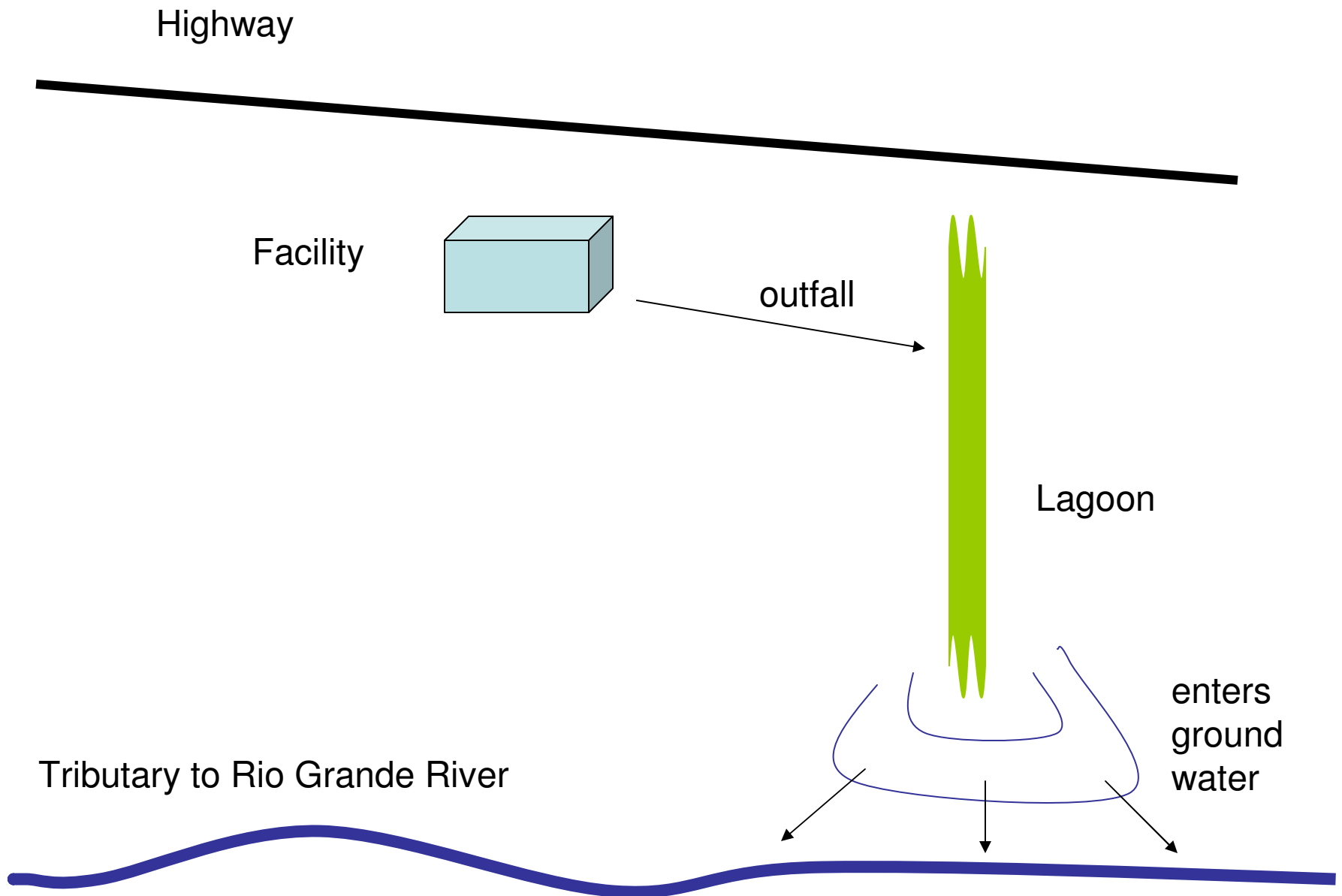
**Treatment** - residual methanol removal (flash distillation at 250F) for recycle

- pH adjustment to 7.0 using phosphoric acid

**Discharge** - effluent enters lagoon and eventually groundwater

- adding cattails and bull rushes to improve lagoon function and create wildlife habitat)

# Overview of Site



**CERTIFICATION  
AUTHORIZATION TO DISCHARGE UNDER THE  
CDPS INDUSTRIAL GENERAL MINIMAL DISCHARGE PERMIT**

**COG-0600734**

**Category 26, Subcategory 2, General Permits, Current fee \$448/year (CRS 25-8-502)  
SIC Code: 4221**

This permit specifically authorizes: *Alta Energy  
Daniel Mortenson, Managing Member  
5492 East Highway 160  
Monte Vista, CO 81144  
(719) 589-2312 Fax (719) 589-3359*

with the facility contacts of: *Robert Bond, Manager*

to discharge from facilities identified as the **Alta Energy**, located at 5492 East Highway 160, Monte Vista, Rio Grande County (Latitude 37° 32' 21.19 N, Longitude 106° 02' 58.14W), as shown in figures 1-3 of this certification, from Outfall 001A. Outfall 001A is discharge of byproduct water from biodiesel production that is treated prior to being discharged to groundwater alluvium tributary to the Rio Grande River, with a maximum flow rate of 9,400 gpd.

The discharge is to the Rio Grande River; Segment 15 of the Rio Grande Sub-basin and Basin, found in the Classifications and Numeric Standards for the Rio Grande River Basin (5 CCR 1002-36), last update effective March 2, 2006. Segment 15 has been designated Use Protected, and has been classified for the following uses: Recreation, Class 2; Aquatic Life, Class 2 (Warm); Agriculture. Applicable limitations and monitoring requirements are listed in the following table.

Parameter	Discharge Limitation			Frequency	Sample Type
	30-day avg	7-day avg	Daily max		
Flow, gpm	Report	NA	Report	Weekly	Instantaneous
Total Suspended Solids, mg/l	30	45	NA	Monthly	Grab
BOD <sub>5</sub> , mg/l	30	45	NA	Monthly	Grab
pH, s.u. (minimum-maximum)	NA	NA	6.5-9.0	Monthly	Grab
Oil & Grease, mg/l	NA	NA	10	Weekly	Visual

Total Phosphorus monitoring is not required. Total Dissolved Solids is not required.

Best Management Practices, as discussed in Part I.E.5. of the permit shall be followed for the duration of the discharge.

Chemicals Used: As part of its permit application signed June 27, 2006, the permittee indicated that the following chemicals are used in the treatment process:

Chemical	Purpose
Phosphoric Acid	pH adjustment

Until approved, use of any chemical in waters that may be discharged could result in a discharge of pollutants not authorized under the permit. However, the permittee may be allowed to use a different vendor for the same compound.

**ISSUED AND EFFECTIVE JULY 13, 2006**

**EXPIRATION DATE JULY 31, 2006**

