

INFORMATION SHEET

ORDER NO. R5-2011-_____
BROWN SAND, INC. AND MOSSDALE ASSOCIATES, LTD.
BROWN SAND MOSSDALE QUARRY
SAN JOAQUIN COUNTY

Background

Brown Sand Inc. has expanded a sand mining and wash plant at 800 W. Mossdale Road, Lathrop, San Joaquin County, adding 380 acres to the existing 303 acre facility. The mine has operated since the early 1990's. Waste Discharge Requirements (WDRs) Order No. 91-217 was issued for excavation of the 303 acre site. Brown Sand Inc. operates the excavation and washing equipment; Mossdale Associates, Ltd. owns the land; together they are hereafter referred to as Discharger. Due to the expansion and the age of the WDRs, the Order is being revised.

The Discharger excavates sand to depths of approximately 60 feet below the ground surface (approximately 50 feet below the water table). At the surface, there is approximately 10-15 feet of topsoil and/or clay. That material is removed and stockpiled for sale as clean fill. Excavation occurs by scrapers, loaders, and/or dragline. Excavated sand is stockpiled on the shore where it drains to the pond before being transported to the wash plant by either conveyor belt or trucks.

No concrete manufacturing using Portland cement occurs at the site. However, in the future, the Discharger may want to sell products containing cement. The Order requires submittal of a separate Report of Waste Discharge (RWD) for production of concrete, cement, concrete products, or disposal of non-cured cement product wastewater.

Domestic wastewater is discharged to on-site septic systems permitted by San Joaquin County Environmental Health. Portable toilets are also available for use.

The site is surrounded by berms or levees, but the levee tops are below the estimated 100-year base flood elevation. Therefore the site is not protected from inundation by the 100-year flood event. Potentially hazardous materials are used and stored on site. The storage areas are approximately 1.25 feet above the base flood elevation; therefore, they should be protected from floodwater. However, because the margin of safety is small and wind driven waves can reduce the margin of safety, this Order requires a Flood Contingency Plan that requires a spill prevention and countermeasure plan.

Wastewater Generation, Flow Rate, and Quality

The source of all wash water is the on-site pond. Since all ponds can be used to dispose of wastewater, they are all considered to be wastewater ponds. Wastewater (turbid water) is discharged via a settling canal (ditch) which is several hundred yards long. The settled fines are periodically removed from the canal and are either stockpiled for sale as clean fill, used on site, or placed in a pond. No dewatering of the excavation is performed.

Wastewater is recycled directly through reuse. Wastewater flow rates vary with the season due to product demand fluctuations. Because the source water originates in a pond, and the wastewater is discharged back to the pond, there is no reason to meter the flow rate. The

Discharger submitted a water balance that demonstrates sufficient capacity at the site to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration using a return period of 100 years. Continued excavation will increase storage capacity as the sand is removed from the site. The Order allows ponds to be constructed anywhere on the property as long as the Discharger is in compliance with the Order and any requirements imposed by other agencies.

The water in the pond presently receiving wastewater has been regularly monitored as required by existing WDR Order No. 91-217. In general, the pond water quality has possessed higher concentrations of dissolved solids than measured in nearby groundwater monitoring wells. This condition is discussed further below.

Groundwater Conditions

Groundwater quality at the expansion area has been investigated by installation and sampling of groundwater monitoring wells, direct push grab groundwater sampling, and pond water sampling. Pond water is in direct contact with groundwater but it is recognized that site activities, evapoconcentration, and other effects has likely affected the pond water chemistry increasing the concentration of Total Dissolved Solids (TDS).

Because the facility is bordered on three sides by surface water bodies - the San Joaquin River (on two sides) and Paradise Cut, surface water elevation has an important effect on local groundwater elevation. Groundwater flow directions near the pond are not defined. A monitoring event on 14 May 2010 showed inward flow direction from the San Joaquin River and Paradise Cut. However, a single monitoring event is not considered reliable evidence of groundwater flow direction or adequate characterization of the potential for changing groundwater flow directions through the year.

Expansion Area Groundwater Quality

Groundwater samples were collected from shallow, medium, and deep zones collected at the expansion area when that area was in agricultural use. The deep zone is at a depth approximately 30 feet below the bottom of the pond and based on a well driller's boring log, a 17 foot thick low permeability zone separates the pond from the deep zone.

Groundwater quality for Total Dissolved Solids (TDS) and Electrical Conductivity (EC) is poor, and often exceeds potentially applicable water quality criteria. Groundwater samples collected from the shallow and medium depth zones exceed water quality standards related to agricultural water use or drinking water levels. Samples from the deep zone, which has not been excavated and as previously noted is separated from the ponds by a 17 foot thick low permeability zone, similarly exceeded upper level drinking water standards. However, the extent of the low permeability zone has not been investigated.

Comparison of Pond Water to Groundwater Quality

Comparison of groundwater quality to pond water samples indicates the pond water has higher TDS and EC values than the shallow and medium zone groundwater. Because the pond is in direct contact with groundwater TDS/EC values at least as high as present in groundwater is

not unexpected. The higher values in the pond are likely the result of evapoconcentration and dissolution of salt contained in excavated sediment into the groundwater. Some dilution of the pond water would be expected seasonally as a result of precipitation.

<i>Groundwater</i>				<i>Pond Surface Water</i>			
<u>Shallow Zone</u>	<u>Depth</u>	<u>EC</u>	<u>TDS</u>		<u>Depth</u>	<u>EC</u>	<u>TDS</u>
PHP-1A	11-16	690	450	BSG-1	Surface	3,100	1,600
PHP-2A	15-20	1,200	650	Lake 1	Surface	1,795	1,160
PHP-3A	12-17	1,200	740	Lake 2	Surface	1,774	1,120
PHP-4A	9-14	1,300	730	Lake 3	Surface	1,715	1,060
PHP-5A	14-19	1,800	960	Ditch 1	Surface	1,718	1,170
PHP-6A	13-18	1,200	650	Ditch 2	Surface	1,754	1,140
PHP-7A	13.5-18.5	1,600	930	Ditch 3	Surface	1,754	1,140
	average	1,284	730		average	1,944	1,199
	median	1,200	730		median	1,754	1,140
	st. dev.	351	175		st. dev.	510	181
<i>Medium Zone</i>				<i>Pond Surface Water</i>			
	<u>Depth</u>	<u>EC</u>	<u>TDS</u>		<u>EC</u>	<u>TDS</u>	
PHP-8B	24-27	2,600	1,700	average 7/09-6/10	2,249	NR	
PHP-8C	50-52	1,800	1,100	median 7/09-6/10	2,320	NR	
PHP-9A	29-33	1,400	880	st. dev. 7/09-6/10	176	NR	
PHP-10A	20-24	1,300	810				
PHP-11A	23-27	1,200	710				
	average	1,660	1,040				
	median	1,400	880				
	st. dev.	573	396				
<u>Deep Zone</u>	<u>Depth</u>	<u>EC</u>	<u>TDS</u>				
PMW-2	90-119.5	2,000	1,000				

The facility is not in an area of historic mining, so mining-related mercury is not expected. However, due to the relatively high values of TDS and EC, and the lack of information on the direction of groundwater movement, investigation of the potential impact of the site on groundwater quality is prudent.

Other Waste Streams

Aggregate processing facilities typically generate associated waste streams. They are described below:

The Discharger does not presently perform gold recovery but may consider adding gold recovery in the future. Any gold recovery performed in activities described in this Order must only use gravimetric methods. No amalgamation or leaching processes can be used in the gold recovery process.

Potentially hazardous materials stored at the site are petroleum fuel, motor oil, hydraulic fluid, transmission fluid, lube grease, gear lube, and similar products. Although the materials are stored on an earthen pad above the base flood elevation, the margin of safety is small; therefore, additional work is required to minimize the potential for hazardous material spills if the site is flooded.

Domestic wastewater from the office and related buildings is discharged to septic systems permitted by the San Joaquin County Environmental Health Department. In addition, portable chemical toilets are available at the facility.

Site Reclamation

The Discharger anticipates aggregate processing will continue for approximately 35 years depending on market conditions. Reclamation will occur concurrently as mining progresses. The current reclamation plan will result in one large lake to be used for aquaculture activities. The current reclamation plan was approved by resolution of the San Joaquin County supervisors on 14 August 2007.

Site Specific Conditions

Based on the California Department of Water Resources rainfall data for the Lathrop weather station, the average annual precipitation is approximately 11.2 inches; the 100-year return annual precipitation is approximately 20.23 inches. Based on the California Irrigation Management Information System (CIMIS) data for Lodi, Manteca, and Tracy, the average annual evapotranspiration is approximately 51.3 inches/year.

Surrounding land uses are primarily agricultural and residential. Stormwater that falls on the site is directed into a pond.

Basin Plan and Beneficial Uses

The Water Quality Control Plan, for the Sacramento and San Joaquin River Basins, Fourth Edition, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Board. Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.

Surface water drainage in the area is to the San Joaquin River. The beneficial uses of the San Joaquin River (within the Sacramento San Joaquin Delta Hydrologic Area) are municipal and domestic supply; agricultural supply; industrial process supply; industrial service supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; wildlife habitat; and navigation.

The beneficial uses of the underlying groundwater are domestic, industrial, and agricultural supply.

Antidegradation Analysis

State Water Resources Control Board (State Board) Resolution No. 68-16 allows the degradation of groundwater quality if the Central Valley Water Board determines that:

- The degradation is consistent with the maximum benefit to the people of the State.
- The degradation will not unreasonably affect present and anticipated future beneficial uses.
- The degradation does not cause exceedance of one or more water quality objectives.
- The discharger employs best practicable treatment and control to minimize degradation.

The treatment and control practices described herein provide commonly implemented treatment and control for the subject wastewater, and should prevent the discharge from creating a condition of pollution or nuisance, and maintain water quality. Settling ponds are routinely used in the aggregate mining industry to settle suspended solids.

The materials used in the Discharger's operation are natural earth materials subjected to a classification and separation process using recycled wastewater and site groundwater. Flocculants may be added to the wastewater pending Executive Officer approval. It is also noted that the Basin Plan encourages reclamation.

Federal regulations for the stormwater discharges were promulgated by the U.S. Environmental Protection Agency on 16 November 1990 (40 CFR Parts 122, 123, and 124). The regulations require that specific categories of facilities which discharge stormwater associated with industrial activities obtain NPDES permits. The Discharger has not obtained a National Pollutant Discharge Elimination System Industrial Stormwater permit. This Order requires the Discharger to obtain the permit or submit a Notice of Non-Applicability.

California Code of Regulations Title 27 Exemption

This discharge is exempt from the requirements of *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq., (hereinafter Title 27). The exemption, pursuant to Section 20090(b) and 20090(h) is based on the following.

- For the exemption based on Section 20090(b):
 - The Central Valley Water Board is issuing waste discharge requirements,
 - The discharge complies with the Basin Plan,
 - The wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22, CCR as a designated or hazardous waste.

- For the exemption based on Section 20090(h):
 - The Discharger will recycle the wastewater after treating the wastewater in the pond system. Settling of soil particles allows reuse of the clarified wastewater. The solid fraction that settles to the pond bottom is inert waste and therefore is consistent with applicable provisions of the division.
 - The recycling will consist of reusing the water in the aggregate processing operations as well as groundwater recharge for later use both on- and off-site.

The Order establishes terms and conditions of discharge to ensure that the discharge does not unreasonably affect present and anticipated uses of groundwater. The Order requires regular groundwater monitoring to determine if groundwater is degraded by the discharge. The Discharger has implemented typical industry best practicable treatment and control measures to minimize degradation.

California Environmental Quality Act

On 16 March 2007 the San Joaquin County Planning Commission approved a Negative Declaration for the expansion of the mine under the California Environmental Quality Act (CEQA). Mitigation measures were not adopted as a condition of the project.

Effluent Limitations

Because the Discharger does not add any additives to the wastewater, and the wastewater consists of water with suspended fine grained sediment, there is little opportunity to impose a limitation on a water quality parameter. Because the pond is in direct contact with groundwater, TDS/EC values at least as high as present in groundwater is not unexpected. The higher values in the pond are likely the result of evapoconcentration and dissolution of salt contained in excavated sediment into the pond. Some dilution of the pond water would be expected seasonally as a result of precipitation or infiltration of surface water through the levees.

Other Requirements

The Provisions require that the Discharger submit the following technical reports:

- Properly permit the site activity under the stormwater permitting program. The Discharger shall obtain coverage under the industrial stormwater permit or submit a notice of non-applicability.
- A *Groundwater Monitoring Well Installation Workplan* for groundwater quality evaluation.
- A *Flood Contingency Plan* that describes hazardous materials stored on-site and a response plan in the event of a potential flood event.
- An *Operations and Maintenance Plan*, the document shall include a *Spill Prevention Control and Countermeasures Plan* to comply with a CEQA mitigation measure.

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- A *Groundwater Monitoring Well Installation Report* describing installation of the groundwater monitoring wells.
- A *Groundwater Quality Investigation Report* to determine background groundwater quality.
- Prior to initiating discharge of cement wastewater, an RWD for the activity is required.

TRO: 1/6/11