Chapter 4.4
HAZARDS AND HAZARDOUS MATERIALS

4.4.1 Environmental Setting

This chapter focuses on the potential impacts of hazardous materials on human health. Hazardous materials that may be used as part of the suction dredge mining process or that may be exposed during the process are described. Potential impacts discussed in this chapter are divided according to human health hazards unique to suction dredging activities and common camping-related hazards. Environmental health impacts (e.g., mercury in fish) related to the use of or exposure to hazardous materials are discussed in other chapters, specifically the Water Quality and Toxicology and Biological Resources chapters.

Suction Dredging Hazards

Suction dredgers use a variety of hazardous materials to collect and process gold. Suction dredgers often recover both mercury (i.e., elemental mercury and mercury gold amalgam) and lead (e.g, fishing weights, lead bullets and shot, diving weights, etc.) while dredging, Dredgers use mercury to recover gold via amalgamation (as described in Section 3.4.7 "Processing of Materials" of Chapter 3, *Activity Description*). They use nitric acid to remove mercury from gold creating a liquid waste containing mercuric nitrate, and gasoline and oil/lubricants to run dredge engines. According to the results of the Suction Dredger Survey (Appendix F), very few suction dredgers reported using mercury and/or nitric acid to process concentrates (1.5% of non-resident and 2.5% of California resident permit holders reported doing so). However, over half of permit holders (56% of resident and 60% of non-resident) indicated that they recovered mercury while dredging. For the 2008 season, California resident permit holders reported removing on average approximately 1.6 ounces of mercury per dredger and non-California resident permit holders reported removing on average 2.6 ounces of mercury per dredger.

Hazardous Materials Associated with Encampments

Most (but not all) suction dredgers camp near the locations where they are mining for short or extended (days to months) periods. In addition to the hazardous materials described above, common materials used, stored, or generated at the suction dredging encampments include gas and lubricants used for generators and vehicles, propane, garbage, and human waste. Although some clubs recommend that all garbage, supply, food, and equipment items be kept safely and in a clean manner to minimize hazards, it has been observed that some miners have campsites strewn with garbage and debris (Sierra Fund, 2009).

The results of the Suction Dredger Survey (Appendix F) indicate that nearly three quarters of in-state respondents stay overnight when dredging, whereas nearly all out-of-state respondents (98%) reported doing so. When staying overnight, 44% of in-state

respondents reported staying in developed campgrounds, while 54% reported staying in undeveloped campgrounds. Similarly, 51% of out-of-state respondents reported staying in developed campgrounds, and 54% reported staying in undeveloped campgrounds. Typically, facilities such as bathrooms and trash bins are not provided in undeveloped campground areas.

California resident permit holders reported an average of 14.69 yearly trips, spending a total of 30.06 days dredging, whereas non-resident permit holders reported less frequent, but longer yearly trips (averaging only 4 trips and a total of 33.39 dredging days). Based on this, in-state permit holders only spent two days dredging per trip on average. Non-resident permit holders on the other hand reported less frequent, but longer trips, spending about 8 days dredging per trip on average. Longer trip durations and greater distances from developed areas increase the quantity and type of personal provisions necessary for such excursions.

Exposure Pathways

Vaporizing mercury and using strong acids may result in a human health hazard. Mercury vapors and mercuric nitrate may damage the central and peripheral nervous systems, lungs, kidneys, skin and eyes in humans (Occupational Safety and Health Administration [OSHA], 1997; Environmental Health & Safety 2009). Additionally, it is also mutagenic and affects the immune system (OSHA, 1997). Acute exposure to high concentrations of mercury vapor causes severe respiratory damage (OSHA, 1997).

Human exposure to nitric acid is through inhalation, ingestion, and eye or skin contact. Nitric acid is an irritant that can cause corrosive effects on the skin, eyes, and mucous membranes (e.g., lungs). Effects of exposure may include any of the following symptoms depending on the exposure pathway, length of exposure, and the acid's concentration: laryngitis, bronchitis, pulmonary edema, dental discoloration, erosion of dental enamel, burns of the skin or mucous membranes, dermatitis, reduced vision, blindness, nausea, vomiting, or death. (Terra Industries Inc., 2006).

Lead is another metal that may present a potential human health hazard to suction dredge miners. Potential lead exposure pathways are: ingesting lead transferred from contaminated hands to food/drink, and inhaling lead fumes while casting diving weights. Lead is not typically absorbed into the body through the skin (Agency for Toxic Substances & Disease Registry, 2007). Effects of lead exposure include damage to the nervous system, increases in blood pressure particularly for middle-age or older people, anemia, and, at high levels, brain or kidney damage and death. (Agency for Toxic Substances & Disease Registry, 2007)

Wildland Fire Hazards

Man-made and natural wildland fires are a hazard throughout most of California, in part due to its Mediterranean climate and typically dry summers. Man-made causes of wildland fires include but are not limited to sparks from engines or other machinery, discarded cigarettes, arson, or campfires that were not properly extinguished. Lightning is the typical cause of natural wildland fires.

The California Department of Forestry and Fire Protection (CAL FIRE) has identified approximately 31+ million acres of state responsibility areas and provided facilities (i.e., control centers, fire stations, etc.) within these responsibility areas to support fire prevention and control (CAL FIRE, 2009). Areas within California that are outside of the state responsibility areas (SRAs) are protected by local (i.e., city or county) or federal agencies. Federal agencies that may be responsible for fire protection on federal lands in California include the U.S. Forest Service and the Bureau of Land Management. Local, state, and federal agencies also provide hazardous material response within their responsibility areas to control and clean-up spills of hazardous materials. Moderate, high, and very high risk wildland fire areas in SRAs have been identified based on fuel, terrain, weather, and other relevant factors in Figure 4.4-1 (CAL FIRE, 2007). Similarly, Figure 4.4-2 indicates fire hazard severity zones throughout California for local or other protection areas (CAL FIRE, 2007).

CAL FIRE also identifies wildland fire risks by county. As an example, a large portion of Yuba County, especially eastern Yuba County, is identified as a very high fire hazard zone in SRAs (Figure 4.4-3). As shown in Figure 4.4-4, most of Yuba County's lands within local responsibility areas are not considered subject to wildland fires (due to agricultural or other land uses) or are only subject to moderate fire hazards (CAL FIRE, 2007).

Local fire departments in California are responsible for fire protection and hazardous response in areas (typically urbanized areas) that are outside of SRAs and outside of federal lands. As an example, local fire protection and hazardous response within Yuba County are primarily provided by the City of Marysville's fire department though other smaller, volunteer fire districts, such as the Smartville Fire Protection District, may also provide some protection or response (Yuba County, 2005; City of Marysville, 2010). The City of Marysville's fire department protects an area of 85 square miles that is comprised of urban, agricultural, and wildland areas (City of Marysville, 2010). The Smartville Fire Protection District is primarily a volunteer force of twelve, with a Battalion Chief (Yuba County, 2005).

Schools

Sensitive receptors for hazardous wastes, including schools, may be located near potential suction dredge mining locations. The proximity of schools to suction dredge locations and encampments would vary throughout the state and annually based on the location of mining activities. For example, within Yuba County, there are five school districts—Camptonville, Marysville Joint Unified, Plumas Lake Elementary, Wheatland Elementary, and Wheatland Union High school districts—and approximately 36 elementary, middle, or high schools (Yuba County Office of Education, 2010). Most of the schools are not located near the rivers or streams of Yuba County. Not counting schools in the City of Marysville, there are 2 elementary schools (Cordua Elementary School and Browns Valley Elementary School) within one mile of the Yuba River, downstream from Englebright Lake and approximately 10 schools in the smaller communities upstream from Englebright Lake. The majority of schools in Yuba County, and indeed throughout California, are located well above and outside of the riverbed. However, there may be some exceptions whereby schools are located in proximity to waterways. For example, in Yuba County there is one school (Browns Valley Elementary School) located within ¼ mile of Dry Creek and another, the Washington Elementary School, located within ¼ mile of the South Fork Yuba River.

4.4.2 Regulatory Setting

The use, storage, and disposal of hazardous materials are regulated by local, state, and federal laws and regulations. The EPA is the federal agency that administers hazardous materials and hazardous waste regulations. The federal Occupational Safety & Health Administration (OSHA) develops and enforces health and safety standards in the workplace and recommends protective measures on the handling and use of hazardous chemicals. The California EPA (Cal/EPA) is one of the State agencies with jurisdiction over hazardous materials; it includes the California Department of Toxic Substances Control (DTSC). Another California agency, CAL FIRE, identifies and reviews wildland fire severity zone designations and provides protection against fires. Local agencies may have their own ordinances regarding the handling, storage, and disposal of hazardous materials and wastes. Local fire departments and hazardous waste collection centers may also serve an important role in responding to hazardous spills or assisting with the disposal of hazardous materials.

A description of each agency's jurisdiction and involvement in managing hazardous materials and wastes is provided below.

Federal Regulations

U.S. Environmental Protection Agency

The EPA is responsible for the enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The federal regulations are primarily codified in 40 CFR. The legislation is outlined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The EPA provides oversight for the storage and use of hazardous materials and has designated some widely generated hazardous wastes, including certain spent batteries, pesticides, mercury-containing equipment and light bulbs, as "universal wastes."

The EPA implements the Emergency Planning and Community Right-to-Know Act (EPCRA). Also known as Title III of the SARA, the EPCRA was enacted by Congress as the national legislation on community safety. This law was designated to help local communities protect public health, safety, and the environment from chemical hazards.

To implement the EPCRA, Congress required each state to appoint a State Emergency Response Commission (SERC). The SERCs were required to divide their states into emergency planning districts and to name a Local Emergency Planning Committee (LEPC) for each district. LEPCs typically consist of representatives from a wide variety of groups, including firefighters, health officials, government and media representatives, community groups, industrial facilities, and emergency managers.

Occupational Safety & Health Administration

As described in the Occupational Safety and Health Act of 1970, the purpose of the OSHA is to ensure workplace safety for all workers in the United States and its territories. To fulfill this purpose, OSHA performs the following functions:

- develop and enforce workplace safety standards;
- approve and monitor state job safety and health programs; and
- provide for research, information, education, and training in the field of occupational safety and health (OSHA, 2010).

Although the federal workplace safety standards and the state job safety and health plans may not be directly applicable to suction dredging activities because the dredging is typically performed as a hobby and not as an occupation, OSHA's human health protection regulations related to the handling and use of hazardous chemicals may serve as a useful guideline for suction dredging miners.

Human Health Protection Measures

OSHA requires that manufacturers prepare material safety data sheets (MSDSs) that include but are not limited to handling and storage recommendations, personal protection measures, accidental release measures, hazards identification, and toxicological information, including recommended exposure limits. Key personal protection measures to protect humans from contact with mercury, nitric acid, lead, and other hazardous materials (ex., gasoline) are summarized below. Vapor exposure limits are listed in Table 4.4-1.

Personal protection measures listed in the MSDSs for the above chemicals focus on methods to prevent exposure to humans through contact with the skin or eyes, inhalation, or ingestion. Safety glasses or goggles are recommended to protect against injury to the eyes. Gloves, closed-toe shoes, and/or aprons are recommended when handling mercury or the acids. Use of these chemicals in open air or well ventilated spaces is recommended because the chemical vapors may be toxic and/or irritants. Following handling of these chemicals, the users' hands should be washed prior to the consumption of any foods/drinks or use of cigarettes to prevent accidental ingestion of the hazardous chemicals. Gasoline is flammable and should not be exposed to sources of flame or heat. Use of a respirator may be required if vapor exposure levels exceed the recommended limits. (Agency for Toxic Substances & Disease Registry, 2007; Albina Fuel, 2009; OSHA, 1997; Terra Industries, 2006)

TABLE 4.4-1. RECOMMENDED EXPOSURE LIMITS FOR CHEMICALS USED IN SUCTION DREDGING

Chemical	Vapor Exposure Limit (milligrams/cubic meters [mg/m^3])
Lead	50 micrograms (µg)/m^3
Mercury	0.1 (PEL)
Nitric acid	2 (TWA) or 4 (PEL)
Gasoline	300 (PEL)

TWA = time-weighted average
PEL = permissible exposure limit
Note: The lead exposure limit was established by OSHA for an 8-hour workday (Agency for Toxic Substances & Disease Registry 2007).
Sources: Agency for Toxic Substances & Disease Registry 2007, Albina Fuel 2009, OSHA 1997, Terra Industries 2006.

State Regulations

According to Title 22 California Code of Regulations section 66261, waste is considered hazardous if it exhibits at least one of the four characteristics of ignitability, corrosivity, reactivity, or toxicity, or if it is a "listed waste." Waste can be liquid, semi-solid, or gaseous.

Department of Toxic Substances Control

In California, the DTSC of Cal/EPA is authorized by the U.S. EPA to enforce and implement federal hazardous materials laws and regulations. California regulations pertaining to hazardous materials equal or exceed federal regulations. The DTSC implements RCRA regulations regarding the storage and use of hazardous materials.

Department of Industrial Relations

California's Department of Industrial Relations includes the Division of Occupational Safety and Health (DOSH) and Occupational Safety and Health Standards Board (OSHSB). The DOSH provides workplace safety and health assistance to employers and workers through its Cal/OSHA program and publishes a wide variety of educational materials on workplace safety and health topics (California Department of Industrial Relations, 2010). The OSHSB adopts safety and health standards that provide the basis for Cal/OSHA enforcement (California Department of Industrial Relations, 2010). Although the adopted safety and health standards are only applicable to workplace safety, many of the advised measures to prevent health effects from hazardous waste or chemicals may also be implemented by suction dredge miners.

Hazardous Waste Control Act

The Hazardous Waste Control Act created the state hazardous waste management program, which is similar to, but more stringent than, the federal RCRA program. The act is implemented by regulations contained in 26 CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification, generation and transport, treatment standards, operation of facilities and staff training, closure of facilities and liability requirements, and design and permitting of recycling, treatment, storage, and disposal facilities.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of them. Under this act and 26 CCR, a generator of hazardous waste must complete a manifest that accompanies the waste from the generator to the transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

Universal Waste Rule

The California "Universal Waste Rule" is a set of regulations that identify "universal wastes" and appropriate disposal methods. "Universal wastes" are considered hazardous upon disposal but pose a lower risk to humans and the environment than other hazardous wastes (DTSC, 2008). In addition to identifying universal wastes, the Universal Waste Rule establishes universal waste transport and handling requirements (DTSC, 2007a). California considers most products containing mercury (ex., fluorescent lamps, thermometers, old batteries, etc.) to be "universal wastes" that must be disposed of at an authorized recycling facility, hazardous waste collection center, or similar approved facilities. Many universal wastes, including mercury products, must be recycled to qualify for the reduced handling requirements for universal wastes instead of the more stringent hazardous waste requirements (DTSC, 2008). It is illegal to dispose of any mercury-containing products in the household trash or at a landfill (CalRecycle, 2010).

Mercury Waste Regulations

A number of California regulations related to the disposal of mercury waste and mercury products have been adopted. Some of the adopted regulations include the Mercury Thermostat Collection Act of 2008, a ban on mercury diostats, and the California Mercury Reduction Act (SB 633), which prohibits the sale in California of vehicles manufactured on or after January 1, 2005 that contain mercury light switches (DTSC, 2007b). Mercury-containing items must be recycled at an appropriate recycling facility or disposed of at a hazardous waste facility (DTSC, 2007b).

Emergency Services Act

Under the Emergency Services Act, the state has developed an emergency response plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Governor's Office of Emergency Services. The office coordinates the responses of other agencies, including the EPA, the California Highway Patrol, the RWQCBs, air quality management districts, and county disaster response offices.

Fire Protection

Wildland fire protection in California is the responsibility of either the State, local government, or the federal government. Local responsibility areas include incorporated cities, cultivated agriculture lands, and portions of the desert. Local responsibility area fire protection is typically provided by city fire departments, fire protection districts, counties, and by the CAL FIRE under contract to local government.

The Government Code chapter defines responsibilities for CAL FIRE and for the local agency. In summary, sections 51178 and 51181 define the CAL FIRE Director's responsibility to identify very high fire hazard severity zones, transmit this information to local agencies, and to periodically review the recommendations. In part, sections 51178.5 and 51179 defines the local agency's responsibility to make the recommendation available for public review and to designate, by ordinance, very high fire hazard severity zones in its jurisdiction.

Local Regulations

Local authorities (e.g., fire departments) would generally be the primary responder to hazardous spills within local responsibility areas. However, for larger spills or in state or federal responsibility areas, state or federal fire and emergency response departments may be utilized.

Hazardous waste collection centers are located in cities or counties statewide to collect hazardous waste and hazardous materials. Types of hazardous materials and waste these facilities will typically accept include but are not limited to: cleaning products, acids, paint, gas and oil, brake and transmission fluids, electronic waste, mercury, batteries, and pesticides. Each facility may apply different disposal requirements depending on the type of disposer (i.e., household, business) and each facility's specific restrictions. One applied restriction is the quantity of hazardous materials accepted at a hazardous waste collection facility from a single disposer at one time. According to a California law, 15 gallons or 125

lbs. of hazardous waste is the maximum amount that homeowners can haul per trip (Yuba Sutter Recycles, 2010). The largest container of hazardous waste accepted is 5 gallons (Yuba Sutter Recycles, 2010). Additional facilities, such as automobile repair shops, may be available to collect specific hazardous wastes (ex., oil).

As an example, Yuba County has a collection center that can accept hazardous waste. The Yuba-Sutter Household Hazardous Waste (HHW) Facility is located at 134 Burns Drive, Yuba City and is only available to collect HHW on Saturdays (Yuba Sutter Recycles 2010). The center accepts all types of hazardous waste described above. Types of waste that this facility does not accept include: tires, medical waste, ammunition and explosives, radioactive materials, compressed gas cylinders, garbage, and medicines (Yuba Sutter Recycles, 2010).

4.4.3 Impact Analysis

The methodology described below accounts for activities conducted in accordance with the proposed regulations contained in Chapter 2. Additional or more extensive impacts related to hazards and hazardous materials may result for those suction dredge activities requiring notification under Fish and Game Code section 1602. Notification is required for the following activities:

- Use of gas or electric powered winches for the movement of instream boulders or wood to facilitate suction dredge activities;
- Temporary or permanent flow diversions, impoundments, or dams constructed for the purposes of facilitating suction dredge activities;
- Suction dredging within lakes; and
- Use of a dredge with an intake nozzle greater than 4 inches in diameter.

A general description of how such activities requiring Fish and Game Code section 1602 notification would deviate from the impact findings are described at the end of the impact section below.

Findings of 1994 Environmental Impact Report

Garbage and sanitation disposal associated with campsites and dredge activities were identified as localized effects. These impacts were considered to be outside of the jurisdiction of CDFG to regulate; however the Report notes that dredgers are subject to Fish and Game Code section 5652 (which prohibits littering) and any regulations made by local and state health departments, the Regional Water Quality Control Boards, and the federal land managing agencies.

Methodology

Methods for determining the potential human health and environmental risks of the suction dredge activities focus on the effects of processing of materials collected during suction dredging, as well as suction dredge encampments more generally, and the potentially hazardous chemicals used to support these activities. Potential human health risks related

to the exposure/mobilization of elemental mercury, mercury enriched sediment, and other contaminants in the river bed are addressed in Chapter 4.2, *Water Quality and Toxicology*.

This chapter's impact analysis considered the locations and types of activities related to the potentially hazardous chemical use and the exposure pathways. Location considerations for determining the environmental and human health risks included the proximity of the suction dredge activities to sensitive receptors or a water body. Types of activities considered include the transport, use, storage, and disposal methods (e.g., vaporizing these hazardous chemicals). The health and environmental risks of suction dredge encampments considered the types of camping activities (e.g., campfires) and the generation and disposal of wastes.

Human health risk exposure pathways considered during the impact analysis were as follows. Suction dredging miners may be exposed to mercury, acids, and lead by direct handling, handling soils and sediments contaminated with these materials, and inhaling and accidently ingesting these chemicals. Exposure to mercury vapor can occur through inhalation and eye or skin contact (OSHA, 2004). Exposure to nitric acid and mercuric nitrate may occur through contact with the skin or eyes, accidental ingestion, or inhalation of acid vapors. Lead (bullets, fishing weights, buckshot) collected during dredging may be accidentally ingested if suction dredgers do not wash their hands after handling it prior to eating or drinking. Lead fumes may also be inhaled if lead is melted and cast into diving weights. Lead is not typically absorbed into the body through the skin (Agency for Toxic Substances & Disease Registry, 2007).

Criteria for Determining Significance

For the purposes of this analysis, the Proposed Program would result in a significant impact if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous material, substances, or waste within one-quarter mile of an existing or proposed school;
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Other impacts related to hazards and hazardous materials were eliminated from further consideration in the Initial Study and are not discussed further here.

In determining significance, the analysis sets as a standard, compliance with the proposed regulations. In other words, dredging requirements that are explicitly included in the proposed regulations (e.g., ban on dredging in proximity of stream banks), and under CDFG's enforcement authority, are assumed to be complied with by participants. For requirements that are under the jurisdiction of another agency (e.g., handling of hazardous

materials, camping), the analysis assumed some level of non-compliance where there was evidence (including anecdotal) to suggest that such non-compliance occurs.

4.4.4 Environmental Impacts

Impact HAZ-1: Use, Handling, Storage, Transport, Disposal and/or Accidental Release of Oil or Gasoline Used in Suction Dredges (Less than Significant)

Suction dredging activities would require the transport, use, handling, and storage of fuel and oil for the operation of a gasoline- or diesel-fueled suction dredge engine. Typically, suction dredge miners would use a motor vehicle or boat to transport the engine, fuel, and oil to their campsites or mining sites, but miners may also carry the equipment if vehicular access is unavailable. Fuel and oil would generally be stored at the mining or campsite area and used, as necessary, during engine refueling, oil changing, or equipment cleaning activities. Accidental spills of fuel or oil could occur during any of the above activities and, if not properly contained and cleaned up, could potentially affect nearby water bodies via indirect (i.e., stormwater runoff) or direct transport. In addition, if miners did not properly dispose of fuels and oils at appropriate waste collection facilities, the fuels and oils would potentially be transported to nearby water bodies. These activities would present a potentially significant hazard to the public and/or the environment.

However, the regulations under the Proposed Program require that miners fuel and service equipment such that petroleum products are not leaked, spilled or otherwise released. In addition, miners are required to comply with relevant hazardous waste regulations (see the *Regulatory Setting* section, above). As detailed in Chapter 2, a "Best Management Practices" informational packet will be distributed by CDFG to provide guidance on safe practices and proper conduct as it relates to suction dredging activities. The "Best Management Practices" guidelines will include an overview of relevant hazardous waste regulations and appropriate procedures to follow in the event of a spill. Such measures may include a description on how and when to notify the Office of Spill Prevention and Response and site remediation steps, as appropriate. Operation in accordance with the proposed regulations and suggested "Best Management Practices" measures would reduce the potential for the handling, use, storage, transport, disposal, and/or accidental spilling of fuels and oils associated with the suction dredge mining activities to significantly affect the public and/or the environment. Therefore, this impact would be less than significant. No mitigation is required.

Impact HAZ-2: Handling, Storage, Transport and/or Disposal of Toxic Materials Collected by Suction Dredges (Less Than Significant)

Suction dredging recovers mercury, lead and other toxic substances from dredged stream sediment. These toxic substances may pose a human health risk, particularly to suction dredge miners, during the handling, storage, transport, and/or disposal processes. Miners may be exposed to mercury via inhalation and eye or skin contact. Handling lead collected by suction dredging or soils contaminated with lead may expose miners to lead. Other toxic substances may be present in black sand concentrates, and may pose a risk to miners during the suction dredging process.

Compliance with applicable laws guiding the proper handling, storage, transport, and disposal of such materials would ensure that significant impacts would not result. If miners

implemented the OSHA-recommended toxic waste handling, storage, and disposal measures, the potential for any risk to the miners' health would be reduced. Similarly, as described in the setting, the State has established regulations related to the transport and disposal of household hazardous wastes (e.g., 15-gallon limit on the transport of household hazardous waste per trip and a 5-gallon limit on the maximum individual hazardous waste storage container size). The designated waste collection centers would accept various types of household hazardous waste, including potentially contaminated dredging concentrates.

However, each hazardous waste collection center has its own specific rules of operation, including types of wastes accepted and waste container labeling requirements, that should be verified with the specific hazardous waste collection center prior to the transport and disposal of hazardous wastes. Information regarding applicable State laws, OSHA-recommendations, and descriptions on how to obtain further information for local disposal and treatment of hazardous materials, will be included in the "Best Management Practices" information document and distributed to each individual permit holder. Compliance with the State regulations regarding the transport and disposal of hazardous wastes and the specific disposal and operation rules of the local hazardous waste collection center would reduce the potential risk of the collected wastes affecting human health or the environment.

No studies were found that documented suction dredger's handling practices regarding these materials; however, numerous anecdotal reports indicate that a substantial number of suction dredgers routinely handle, store, transport, and dispose of these materials in violation of existing laws (see for example Sierra Fund, 2009). Though such practices could result in the exposure of people or the environment to hazardous conditions, there has been no effort to determine if violations are common place. However, since the total number of suction dredgers state-wide is small, and the number of violations anticipated to be even smaller, such effects would not constitute a significant impact.

Impact HAZ-3: Use, Handling, Storage, Transport, Disposal, and/or Accidental Release of Materials Used to Process Suction Dredge Concentrates (Less than Significant)

Mercury may be used to amalgamate gold from suction dredging concentrates and nitric acid or heat may be used to remove mercury from gold. Mercury and nitric acid are hazardous chemicals and mercury vapor and mercuric nitrate (in "spent" nitric acid) are highly toxic. Humans exposed to mercury, mercury vapor, mercuric nitrate, or nitric acid may suffer a variety of health insults depending on the severity (i.e., duration and quantity) or mode of exposure. Exposure to mercury vapor can occur through inhalation and eye or skin contact. Humans may be exposed to nitric acid through contact with the skin or eyes, accidental ingestion, or inhalation of acid vapors. Suction dredge miners, in particular, could be exposed to any of these hazardous chemicals during use, handling, storage, transport, or disposal. In addition, accidental spills of any of these substances could result in potential impacts on human health and/or the environment.

As discussed in Impact HAZ-2, compliance with laws guiding the proper use, handling, storage, transport, and disposal of mercury and nitric acid would reduce the chances of significant impacts. If miners implemented the OSHA-recommended hazardous chemical handling, storage, and disposal measures, the potential for risk to the miners' health would be reduced. In addition, as discussed in HAZ-2, the State has regulations regarding the

maximum quantity of household hazardous wastes that can be transported per trip and the maximum volume of an individual hazardous waste storage container. Hazardous waste collection centers may also have specific rules related to the types and quantities of hazardous wastes accepted. Thus, if suction dredge miners complied with the State regulations regarding the transport and disposal of hazardous chemicals/wastes and the specific disposal and operation rules of the local hazardous waste collection center, the potential risk of mercury or the acids affecting human health or the environment would be reduced. The designated waste collection centers would accept various types of household hazardous waste, including acids and mercury.

As previously noted, CDFG will provide information regarding the recommended and/or required protocols for the use, handling, storage, transport, and disposal of these hazardous chemicals in the "Best Management Practices" information document. This guidance document will be distributed to each individual permit holder to inform safe practices and proper conduct during dredge operations. If all suction dredge miners rigorously implement all of the recommended and/or required protocols, the chances of significant hazardous waste related incidents would be reduced. As such, this impact is considered to be less than significant.

Impact HAZ-4: Human Wastes from Dredge Encampments (Less Than Significant)

Suction dredge miners would generate human wastes (i.e., garbage, human excrement, etc.) at the mining sites or campsites. Existing laws, including those established by land managers (e.g., U.S. Forest Service or BLM), govern the handling and disposal of human waste at campsites. No studies were available for this SEIR that comprehensively documented suction dredger's compliance with these laws; however, numerous anecdotal reports indicate observations of unsanitary conditions at suction dredge encampments (see for example Sierra Fund, 2009). Improper disposal of human waste may lead to the exposure of people or the environment to hazardous conditions, including the transmission of disease-causing bacteria, and is considered a significant impact.

CDFG will incorporate into the "Best Management Practices" information document, guidance for the proper disposal of waste, including human waste, such as to avoid disturbance or contamination of streams, lakes or their surrounding environments. While such measures are outside of CDFG's jurisdiction to regulate, violations may be reported to the local authorities.. Therefore, this impact is considered to be less than significant.

Impact HAZ-5: Safety Hazards to Dredgers and Others from Suction Dredge Operations, Equipment, and/or Geomorphic Changes (Less than Significant)

Certain practices, including anchoring equipment across or along channels, creation of dredge potholes or tailings piles, and equipment staging may create safety issues to the dredgers or other individuals in the vicinity. The hazards presented by these items would be regulated by local law enforcement entities. While anecdotal reports exist regarding the hazards associated with these items, no specific incidents have been identified.

In addition, the Program includes general requirements prohibiting power-winching and any permanent grade alteration in the water body, and restricting the placement and movement of stream substrate. These requirements would reduce the potential for the

suction dredge miners to create any long-term significant safety hazards. Therefore, this impact is considered less than significant.

Impact HAZ-6: Exacerbation of Wildland Fires (Less than Significant)

Typically, suction dredge mining activities would occur in undeveloped, remote locations where wildfires are a concern and when wildfire risk is high. The use of certain equipment, including engines and hazardous materials (e.g., fuels, oils, etc.), during suction dredging activities may cause accidental wildfires. In addition, campfires used by miners during overnight camping excursions would pose a wildfire risk if the fires were not properly controlled or extinguished.

However, the equipment used by suction dredgers is not substantially different from those used by other motorized recreationalists and, with implementation of standard precautions, would not be anticipated to result in a substantially increased threat of wildfire. Similarly, the wildfire risk associated with miners' campfires would not be substantially different than the risks from other overnight recreationalists. Suction dredge miners are required to comply with applicable wildfire-prevention measures, including limits or prohibitions on the use of campfires, established by the private land owners or state and federal land management agencies (e.g., U.S. Forest Service or BLM). An overview of applicable wildfire-prevention measures will be incorporated into the "Best Management Practices" informational packet and distributed to all permit holders. Thus, the risk of wildfire under the Proposed Program is considered to be less than significant.

Impact HAZ-7: Create Safety Hazards or Releases of Hazardous Materials in Proximity to a School (Less than Significant)

As described in Impacts HAZ-1 through HAZ-6, the suction dredging activities would require the use of hazardous materials and the potential creation of safety hazards. These hazardous materials would pose a potential hazard to sensitive receptors (i.e., schools) if they were transported (ex., via stormwater runoff) to nearby receptors. Schools or other sensitive receptors in proximity to rivers or creeks would have a relatively higher potential to be exposed to hazards associated with suction dredging. However, as described previously, suction dredging activities would typically occur in undeveloped, remote locations along rivers or creeks. Therefore, the likelihood of the hazards identified under Impacts HAZ-1 through HAZ-6 occurring near schools is considered low. As such, the potential for hazardous emissions or the handling of hazardous or acutely hazardous material, substances, or waste to occur within one-quarter mile of an existing or proposed school is not considered to be substantial. This impact is less than significant.

Impact HAZ-8: Exposure to Mercury or Acid Vapor (Less than Significant)

Suction dredge miners may vaporize hazardous chemicals (i.e., mercury, nitric acid, lead) during waste disposal or gold processing procedures. Vaporizing mercury, while illegal, is a disposal method known to be used by some suction dredge miners. A small portion of miners process their gold using mercury or nitric acid; however many miners do not (Suction Dredger Survey Results, Appendix F). Miners processing gold using mercury and nitric acid do so at their campsites and homes, in a garage or similar space. Mercury, mercuric nitrate, or nitric acid vapor inhalation may result in a human health hazard.

No studies or anecdotal reports were available during the preparation of this report that indicated that incidents of mercury or acid poisoning of suction dredgers are a substantial concern. However, as a precaution, safety warnings against improper usage and handling of mercury or other hazardous chemicals will be included in the "Best Management Practices" informational packet. For this reason, impacts are considered less than significant.

Activities Requiring Fish and Game Code Section 1602 Notification

Activities which require notification under Fish and Game Code section 1602 may increase the potential for adverse effects related to hazards and hazardous materials. The increased substrate movement capacity associated with the use of larger nozzle sizes could increase the amount of recovered hazardous materials (i.e. mercury and lead) and cause greater alterations to the streambed. Power winching may leave heavy objects in a precarious state, subject to later movement from settling or disturbance. In addition, the use of additional equipment associated with power-winching may require greater amounts of fuel and lubricants for use and storage on-site, increasing the potential for spills. Furthermore, dredging in lakes or diverting flows could increase physical alterations and safety hazards in areas which would not otherwise be affected by dredging activities. Such issues, to the extent to which they could be significant, would need to be evaluated in a CEQA document.

Effects associated with the creation and disposal of human waste and safety hazards near schools are not anticipated to differ substantially for activities requiring notification and those which comply with the proposed regulations. Common adherence to the proposed regulations and the "Best Management Practices" guidance would ensure that effects remain below the threshold of significance. Therefore, these issues are not believed to require further evaluation.