6 LAKE BERRYESSA MARINA

6.1 Waste Water Systems

Ponds:
There are five evaporation ponds. Each pond has two misters, but the misters are not functional (they spray a single stream instead of a mist). The ponds are clay lined. A large quantity of toilet paper had accumulated by the pumps. Many portable toilets are located throughout the campground, which would reduce the amount of wastewater being pumped to the ponds.

The wastewater retention ponds at Lake Berryessa Marina are undersized for the current resort development. This conclusion is based on the presence of discrete overflow pipes, implementation of spray disposal fields, and reports of the ponds being overtopped. Spray disposal that is being performed should be ceased immediately because the wastewater that is being discharged is minimally treated (spraying occurs during peak usage), the wastewater is not disinfected, and the potential for human pathogenic contact is very high.

Lift Stations:
There are two lift stations for 120 hookups.
LS 1: There are two submersible pumps that transport sewage for approximately 8 trailers with washrooms.

LS 2: This lift station has two underground septic tanks. Residual lime or powdered chlorine was evident around the lift station at the time of inspection, indicating a recent overflow and attempt to disinfect the area.

Each of the lift stations was found to be unacceptable for continued use. The lift stations would require, at a minimum, additional reliable pumping capacity, new instrumentation and controls, a functional alarm system, and standby power facilities in order to be adequate. In addition, the structures housing the pump stations are substandard.

Imhoff Tank:
This tank, which was built in the early 1970s, is approximately 16’ by 20’ in plan and 20’ deep. It is equipped with a generator, two Baldor pumps, a mercury switch to activate the system, and an alarm system with bells and lights. The tank is covered with plywood. A four-foot cinder-block wall surrounds the tank. A pitched wooden roof on timber supports covers the structure. Security fencing around the perimeter is provided.

Lake Berryessa Marina does not have a map showing the size, length, or alignment of the pipelines, manhole locations, or other important information.

6.2 Potable Water Systems

Treatment Plant:
The large filter (Kellog-American) and four smaller ones (Everfilt) located at this treatment plant are automatically backwashed daily. No alarm is in place. The capacity of the treatment facility was reported to be approximately 25,000 gallons per day, but the logs at a glance showed numbers far exceeding that number (up to 86,000 gpd delivered). The submersible pump for the lake water intake was reported to be three feet from the surface.

Storage Tanks:
Three storage tanks for 270 hookups.
Two tanks are situated in the same vicinity. There is a 4000 gal redwood and a 2000 gal high-density polyethylene tank that are sealed with plastic liners. The straps on both tanks have been displaced. There are 2-10 horsepower pumps to get water up the hill. The third tank is a lined, concrete unit. It has a booster pump to route the water to the other storage tanks, which sit at a higher elevation. It is equipped with high and low water level sensors to control the pumping process.

6.3 Roads/Parking Lots

Pavement Section:
Collector roads are in fair condition, with limited areas of fatigue failure. Secondary access roads are also in fair condition, but are more variable than the collector roads. Some secondary roads appear to be relatively new. For a 20-year design life, all areas of severe alligator cracking should be excavated and replaced with compacted aggregate base and a 1-inch thick asphalt patch to match the level of the existing roadway. Collector roads should then receive an asphalt concrete overlay that is 2 inches thick. Secondary roads should receive an asphalt concrete overlay that is 1.5 inches thick.

Geometry:
The width of most collector roads is adequate, with the exception of the last few hundred feet of the northerly road, where some widening is recommended. No areas of severe curvature or overly steep grades were noted. After receiving an overlay these roads should be striped and signed. Most secondary roads are not wide enough to accommodate two-way traffic. However, in nearly all areas there is either the potential to create one-way loops, or the roads are short, less than 200 feet long. There are, however, two areas where we would recommend widening the road to accommodate 2-way traffic and constructing a fire truck turn around at the end of the road. There are also several areas where trailers are very close together and parking is

inadequate, resulting in cars being parked on the road. There is one location where the radius of a curve needs to be increased to permit fire truck access. Although the site grades will generally permit these modifications, in several areas it appears that it will be necessary to remove some trailers. One or two areas were noted where grades were in the range of 20%. All of the above noted areas should be surveyed to determine the appropriate roadway geometry. After geometric modifications and overlays are complete these roads should be signed.

Other Considerations.
None noted.

6.4 Electrical Systems

The resort is served by an overhead high voltage distribution system with pole-mounted transformers owned by PG&E that runs through the marina. The main PG&E service point is near the office/store. Power is distributed to nearby concession buildings from this distribution point via a resort-owned distribution system. More distant concession buildings generally have individual PG&E meters. Electrical services ranged from poor to good. Internal wiring condition ranged from fair to good. Generally, the majority of the electrical systems are adequate for current use, but not adequate for long term use. Several code viloations were noted during the site inspection.

6.5 Boat Launch Facilities

The boat launch ramp at this resort is approximately 128 feet wide and 107 feet from the top of slope to the water line at the time of the assessment. The resort rates the ramp as having a two launching lane capacity. The ramp is constructed of a 3-inch thick asphaltic concrete pavement and has an average slope of approximately 15.6 percent. The wearing surface is not scored and appears to be in fair condition. As with the other resorts, the ramp edges are showing signs of deterioration. The turnaround area at the head of the ramp is adequate.

There is a single, approximately 225 foot long courtesy dock located at the ramp. The dock contains no berths and is for short-term boat mooring. Access to the float is made by a gangway ramp. Non-encapsulated foam billets provide flotation for the dock and gangway. The decking is timber topped with plywood. The dock is held in position and adjusted through the use of anchor chain lines secured to a concrete block. The dock appears to be in fair to poor condition with varying freeboard indicating deterioration of some of the floats and the decking showing wear.

The ramp appears to be in acceptable condition. The location and accessibility of the ramp are acceptable. There is adequate parking space on the peninsula above the top of the ramp. Slope

protection along the ramp edges should be considered to prevent future erosion and curbs may be needed to define the ramp boundaries.

The boat launch ramp may be retained at this location. The courtesy dock should not be retained for future use given its state deterioration and the non-encapsulated foam floats.

6.6 Shoreline Developments

The only slope protection/retaining structures determined to have expected reasonable design lives, are the structures around the peninsula for the resort support facilities (restaurant, store, rentals, etc). The northerly side of the peninsula has boulder rip rap that has been stabilized with shotcrete. The easterly and southerly sides have a pressure-treated wood tie-back wall, with a gravel and rock backfill. No other retaining structures were determined to have a significant performance life.

The following is a listing of retaining structures that appear to be acceptable structures, having a reasonable design life, if properly maintained:

- Spaces 41 through 49, including boat trailer parking strip: shotcrete and boulder rip rap, appears to be very stable.

- Spaces 15 through 36: pressure-treated timber and lagging tie-back wall, 10’ to 15’ high, rock and gravel backfill material.

All other shoreline developments are not recommended for future use and should be removed.

6.7 Marinas and Fuel Systems

6.7.1 Dock Facilities

This resort has a total of 261 slips including a facility for personal watercraft and houseboat rentals. Dock #1 is adjacent to the timber bulkhead wall contains 13 slips. The floats are enclosed corrugated metal pipes. The access ramp decking is timber and the dock has composite decking. The ramp is pinned to the main dock through the use of a pipe hinge. There is a gated entry. The dock is held in position by the use of two chain anchor lines attached to the front of the main dock from the shore. The fingerfloat rub protection consists of corrugated fire hose nailed to timber. Overall the main dock and fingers appear to be in fair condition. The access ramp needs to be replaced and a more permanent means of securing the dock should be implemented.

Dock #2 is the personal watercraft rental dock. The rental office is located at the end of the access ramp. The dock and decking are both constructed of timber. The floats are non-encapsulated foam showing deterioration. Several of the slips have been converted into personal watercraft storage and there are storage boxes located near some of the slips. A shop or storage shed is located near the end of the dock. It has electricity and appears to have fuel storage. There are plywood ramps for use by the personal watercraft bolted within some of .the berths by means of a pipe hinge.

The dock is in poor condition overall. The decking is in poor condition and the fingerfloats do not maintain a level freeboard. The protective strips on the float edges are in poor condition. The access ramp is in deteriorated condition, with the foam floats showing advanced damage.

Dock #4 contains the houseboat rental facilities for the resort. The main walkway has three segments. The first is the access ramp, constructed of timber decking and encapsulated floats, extending from the edge of the boat launch ramp. There is no handrailing on this ramp. The ramp is connected to another walkway segment, constructed with timber and utilizing the encapsulated floats. Two separate floats are located on either side of this section. One supports a storage shed, and the second contains a pump for the sewer cleanout. Corrugated steel pipe pontoons support both of these floats. The third and final segment of the main walkway is constructed of composite decking and modular enclosed floats. The sewage-holding tank is located beneath this float. There are vents located on the top of the deck. Protective timbers run the length of both sides of the float. There is no fendering or rub strips. This section of the dock is in very good condition with a consistent freeboard.

Dock #5 contains 20 covered berthing slips. There is a gated entry at the on the shore side of the main dock. An access ramp extends 150 feet from the shore to the main dock. The ramp appears to be in poor condition. The floats are non-encapsulated foam showing signs of deterioration. The access ramp does not have a consistent freeboard. The timber decking is worn and loose in some places and the handrailing is loose. The ramp is secured by the use of two anchor chain lines. The main dock utilizes composite decking and a combination corrugated metal pipe pontoons of non-encapsulated foam for floats. Chain anchor lines secure the main dock. They are secured to ballast on the lake bottom.

The fuel dock is a separate dock located at the end of the main dock and is constructed of plastic composite decking. The flotation system consists of plastic encapsulated floats. The fuel dock appears to be in fair condition.

Overall, Dock #5 is in fair condition. The decking is in fair condition, but the freeboard varies over the length and width of the dock. The rub strips and protective components of the dock are in poor condition. The access ramp is considered to be in fair to poor condition.

Dock #6 is covered and contains 40 berths. There is a security gate located on the front of the main dock. Dock #6 consists of two separate 128-foot sections pinned together. The dock and

access walkway are constructed of galvanized light gauge steel framing with composite 2x6 decking. The floats are encapsulated polyethylene tubs similar to those used on Dock #4. The dock hardware is in very good condition as is the entire dock. The covered structure is comprised of steel decking and galvanized steel framing, all in very good condition. The dock maintains a consistent freeboard indicating little water absorption by the floats. The access walkway and the ramp do not have handrailing. The dock is held in position by the use of anchor chain lines running the dock to the shore from either side of the access walkway. Winches are used along either side of the length of the main dock to control the anchor line tension.

Dock #7 contains 40 uncovered berthing slips. The dock is similar in composition and configuration to Dock #6 with the exception being the lack of a roofing structure. There is a gated entry to the main dock. As with Dock #6, the main dock is in very good condition. The 30-foot access ramp extending from the shore is in poor condition, however. The timber decking is in bad shape, as are the non-encapsulated foam floats. There are no handrails. The ramp is held in position through the use of two anchor chain lines secured on the shore to trees.

Dock #8 is covered and has a 24 berthing slip capacity. There are two uncovered berths. The dock has a gated entry. The components include 2x12 timber decking and timber dock framing. The floats are non-encapsulated foam. The roofing structures consist of separate galvanized steel supporting frames and steel decking roofs. This dock is in fair to poor condition overall. The decking, although protected, is worn and the floats are showing deterioration. The freeboard is not consistent across the dock dimensions. The roofing structure is in fair condition with some surface rust apparent.

Dock #10 is a covered, 28 slip capacity dock. There is a gated entry. The dock components consist of timber framing and decking with non-encapsulated foam floats. The roofing structure is similar to Dock #8 in a similar condition. As with Dock #8, the decking is showing wear and the floats have deteriorated slightly. The measured freeboard is slightly inconsistent across the dock. The protective rub strips along the fingerfloats are in poor condition. Two anchor chain lines running from the main walkway to the shore secure the dock. In addition, the outer end of he main walkway is anchored.

Dock #12 is similar to #10 with the exception of four berths being uncovered.

Due to the extensive use of non-encapsulated foam flotation billets at this resort and the deterioration that has occurred, many of the docks are not recommended for future service.

It is recommended that all docks with the exception of the houseboat rental dock (#4), the fuel dock at the end of Dock #5, Dock #6 and #7 should not be retained for long term use. The access ramp to Dock #7 and the houseboat rental dock should be replaced as they are constructed with non-encapsulated foam billets and timber decking that will deteriorate over time.

6.7.2 Fueling Services

There is a fuel dock located at the end of the Dock #5. There are two dispensers located on the ends of a Tee shaped dock. Parking stalls are located on each side of the walkway from the main dock. There is a double compartment storage tank on shore. The tank holds supreme unleaded and regular unleaded. There is a dispenser at the storage tank for ground vehicles. The tank is piped to the two dispensers on the dock and the dispenser at the tank. The dock dispensers have a hose and service station type nozzle for each fuel. The hoses are connected to hose reels for added hose length. The dispenser at the tank has a single hose for regular unleaded.

The dispensers at the dock have a containment sump with a float that can trip a mechanical valve in the dispenser piping to stop fueling operations. There is a spill response kit on the fueling dock.

The storage tank is located on shore adjacent to the grocery store. This is a sloping paved area. The storage tank is an above grade, horizontal, cylindrical double wall tank that sits on a concrete slab with a curb around it. The tank has two compartments. The compartment for unleaded supreme is 2,000 gallons and the compartment for unleaded regular is 4,000 gallons. Tank appurtenances for each compartment include a primary vent, emergency vent, fill line, vapor recovery line, gage hatch, product dispensing pump and sight gage. In addition, the 4,000-gallon compartment contains a secondary emergency vent and a piping connection for the dispenser at the tank. There is no ladder for access to the top of the tank. There is no leak detection monitoring system for the tank. There is no containment parking area for the tank truck and ground vehicles.

Each tank compartment has a 3-inch fill line, 3-inch vapor line and 2-inch product dispensing line. The fill line has a coupler, shut off valve and containment sump with a hand pump to return spills to the tank. The vapor line has a coupler. The pump dispensing line does not contain an on/off solenoid valve. Two 1 ½ inch galvanized lines are routed above grade toward the fueling dock. The piping is attached to a perimeter wooden walkway. The piping terminates in a wooden valve box with a ball valve. Hose connections are made here and the hoses are routed down the shoreline to the boat dock. A connection is made on the dock to galvanized steel piping which is located in a piping trough in the walkway. A hose connection is made again to the fueling dock steel piping at the end of the walkway. The piping to the two dispensers is routed under the fueling dock. Shut off valves are located at the hose connections. There is an emergency shut off switch on the boat dock.

The on-shore piping does not conform to the California Fire Code, Section 5202. The piping is 1 ½ inch Schedule 40 galvanized steel pipe with threaded joints. Valves are bronze, threaded. The threaded joints are corroded and are not made up properly. Some of the joints are leaking. Threaded pipe should be gauged to check for conformance to American Standard taper pipe

threads before being made up. Bronze valves are a low-melt material. This piping is suitable for potable water, but not for fuel piping. The piping is inadequately supported.

Suitable fuel piping for this service would be 1 ½ inch Schedule 80 black steel pipe with socket weld joints or threaded joints. The threaded joints would be gauged. Socket weld joints are preferred. Threaded joints would be used where necessary for equipment connections. Valves would be steel. The piping would be painted and attached to substantial supports.

The dock piping does not conform to the California Fire Code, Section 5202. Dock piping is the same material as on shore piping. Connection to shore piping is made with fuel hose. There is a substantial length of fuel hose attached to the floating dock nearest shore and is used in lieu of hard piping. Hose couplings are threaded. The piping is in a covered piping trough on the second floating dock, but is under the floating fuel dock and is not accessible.

Suitable fuel piping for this service would be flexible double wall pipe in a ducted metal jacket. Leak detection is not required. Final connection to the dispensers would be made in a sump box. This type of piping is specially designed for marina installations.

6.8 Preliminary Environmental Assessement

A site visit was conducted to assess and photograph present site conditions. Ms Sally Vaughn, resort manager, was interviewed regarding site history and operations. Results of the interview and site observations are presented in the following table. Results of the preliminary environmental assessent are summarized in the following site observations table:

SITE OBSERVATIONS

General Observations	Remarks	Observed	Not
Current Use	Resort with motel, restaurant, store boat facilities and mobile homes	X	
Past Use			X
Structures	Numerous buildings, restrooms, kiosks, office, restaurant, store	X	
Terrain	Varied	X	
Interior and exterior observations or environmental conditions that may involve the use, storage, disposal or generation of hazardous substances or petroleum products.		**Observed**	**Not Observed**
Hazardous chemical and petroleum products in connection with known use. Fill dirt from an unknown source.			X
Aboveground storage tanks (ASTs)	Unleaded/Super/Premium gasoline near store.	X	
Underground storage tanks (USTs)			X
Odors			X
Pools of Liquid			X
Drums	.		X
Hazardous chemical and petroleum products in connection with unknown use.			X
Unidentified substance containers			X

SITE OBSERVATIONS (CONTINUED)

Interior and exterior observations or environmental conditions that may involve the use, storage, disposal or generation of hazardous substances or petroleum products.		**Observed**	**Not Observed**
Chemical storage or agricultural chemical mixing areas	Small quantities of pesticides/herbicides such as Roundup	X	
Asbestos, and lead based paints	Not assessed		
Polychlorinated biphenyls (PCBs)			X
Pits, Ponds, or Lagoons	Waste water ponds.	X	
Stained soil or pavement			X
Stressed vegetation			X
Hazardous Waste Storage			X
Solid Waste			X
Waste Water		X	
Process waste water			X
Wells			X
Dry wells			X
Surface water	Waste water ponds on hill above site	X	
Storm basins/catch			X

TABLE 7 (CONTINUED)
SITE OBSERVATIONS

Interior and exterior observations or environmental conditions that may involve the use, storage, disposal or generation of hazardous substances or petroleum products.		**Observed**	**Not Observed**
Storm drains			X
Drains and sumps			X
Septic system			X
Loading and unloading areas			X
Burned or buried debris			X

In summary, the environmental survey did not reveal recognized environmental conditions at the site. Small quantities of pesticides/herbicides such as Roundup are used on site.