

- **Board of Directors**  
***Diamond Valley Recreation Special Committee***

October 8, 2002 Board Meeting

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**8-6**

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**Subject**

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Approve conceptual sanitation plan for recreation within the Diamond Valley Lake watershed

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**Description**

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**Attachment 1** sets forth a conceptual sanitation plan for recreation within the Diamond Valley Lake (DVL) watershed. The purpose of the sanitation plan is to set forth the guidelines and methodology to provide appropriate sanitation facilities for the public while protecting raw water quality. The plan proposes quantities, locations, and types of toilets as an example to demonstrate that the guidelines and methodology can be met, which is subject to change. This plan would also address design guidelines, maintenance, and emergency response procedures. The California Department of Health Services (CDHS) must approve a sanitation plan (as part of a larger Recreational Activity Plan) prior to any on-going recreational activities within the watershed. Special events currently planned within the watershed are approved by CDHS on a case-by-case basis.

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**Policy**

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By Minute Item 43238 (October 13, 1998), the Board of Directors approved a policy allowing recreational activities that involve no body contact with the water in DVL. Additionally, by Minute Item 43403 (February 9, 1999), the Board approved a policy allowing certain recreational boating activities on DVL. The attached sanitation plan (**Attachment 1**) is consistent with previously adopted board policies.

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**California Environmental Quality Act (CEQA)**

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CEQA determination for Staff Recommendation:

The proposed action is exempt under the provisions of CEQA, since it involves only a conceptual plan associated with feasibility and planning studies for possible future actions, as well as basic data collection and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These activities may be strictly for information gathering purposes, or as part of a study leading to actions that a public agency has not yet approved, adopted, or funded. As such, this proposed action qualifies both as a feasibility and planning studies exemption (Section 15262 of the State CEQA Guidelines) and as a categorical exemption (Class 6, Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under both a feasibility and planning studies exemption and a categorical exemption (Class 15262 and Class 6, Section 15306 of the State CEQA Guidelines).

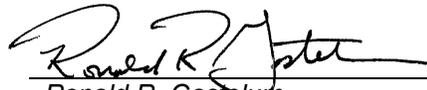
**Staff Recommendation**

Adopt the CEQA determination and approve the conceptual sanitation plan for recreation within the Diamond Valley Lake watershed.

**Fiscal Impact:** The cost of providing sanitation facilities and associated access to the facilities have not been determined at this time but are included within the budgeted DVL recreation program costs.

  
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Bill T. Wicke  
Manager, Water System Operations

9/6/2002  
Date

  
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Ronald R. Gastelum  
Chief Executive Officer

9/9/2002  
Date

**Attachment 1 – Conceptual Sanitation Plan for Recreation within the DVL Watershed**

BLA #1963

**THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**

**CONCEPTUAL SANITATION PLAN FOR  
RECREATION WITHIN THE  
DIAMOND VALLEY LAKE WATERSHED**

**August 22, 2002**

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## 1.0 Executive Summary

This conceptual sanitation plan describes sanitation facilities for planned public access and recreation at Diamond Valley Lake. These facilities shall be convenient and available to the public at suitable locations. The plan sets forth the guidelines and methodology to be used to determine the quantities, locations, and types of toilets and other sanitation facilities. The quantities and locations proposed in this plan are presented as an example that meets the guidelines, but are subject to change.

The sanitation plan will be phased in as the development of the marinas progresses. Phase I addresses facilities for the opening of the East Marina in mid-summer 2003. Phase II describes an expanded marina development anticipated by July 2005. This sanitation plan proposes the number and location of toilets for Phase II. The actual number and location of sanitation facilities for Phase I will be determined based on the construction schedule of such facilities by mid-summer 2003. Recreational areas/activities will be open to the public only if the appropriate sanitation facilities are installed. Due to the phased approach of the sanitation plan, portions of the reservoir, which have appropriate sanitation facilities, may be opened to recreation earlier than other areas.

The plan includes recommended toilet types for both Phase I and II. The type of toilet selected was based on the evaluation of the following factors:

- (1) Available infrastructure
- (2) Risk to water quality
- (3) Number of uses per toilet
- (4) User accessibility
- (5) Capital and operations & maintenance cost

General design guidelines and information on maintenance and emergency response is provided. This plan does not address sanitation facilities for recreational uses outside of the watershed.

**Finally, once Metropolitan's Board of Directors approves the sanitation plan, the final plan must be submitted to the California Department of Health Services (CDHS) for their approval to amend the existing drinking water supply permit for recreational use at Diamond Valley Lake.**

## 2.0 Description of Recreational Usage to be Supported

The proposed recreational activities allowed on or around the reservoir for Phase I includes:

### Hiking

Approximately 28 miles of multi-use trails will be provided which includes a loop trail around the lake. Additionally, there will be a 3-to-4-mile pedestrian-only trail inside the watershed in the North Hills area, which uses a portion of the High Water Road. It is proposed that the East Marina will include sanitation facilities (toilets, handwashing, and trash collection) at the trail head for the pedestrian-only trail. Another sanitation facility will be located at the end of the pedestrian-only trail (toilet only, Location #2 on Figure 1).

**Horseback Riding**

Horses will be allowed to use the same 28 miles of multi-use trails described above. Because no permanent equestrian trails are within the watershed, sanitation facilities are not described herein.

**Boating**

Boating activities will be allowed which are consistent with State regulations, the Board’s boating policy, public health requirements, and previously issued environmental impact reports concerning recreation. Sanitation facilities will be needed for boaters at the marinas and around the lake.

**Shore-line fishing**

Areas for shore-line fishing have not been designated, but will likely be within walking distance from the East Marina. Therefore, sanitation facilities for shore-line fishing will be provided only at the East Marina. If other areas are designated in the future, additional facilities will need to be added.

**Camping and picnicking**

Camping and picnic/day-use areas are not currently planned; therefore, general use will be limited. Sanitation facilities for general visitors will be located at the marina areas.

**3.0 Expected Visitor Usage**

The data shown in Table 1 were provided from Asset Management regarding daily and annual visitor usage. These visitor projections were used to determine the appropriate number and size of facilities.

Table 1. Expected Daily and Annual Use of DVL Recreational Areas

		Persons	Vehicles	Boats
Daily Use	Average	135	45	30
	Maximum	2,025	675	450
Annual Use	Average	51,100	21,900	10,000
	Maximum	180,000	60,000	40,000

These numbers assume no restriction on fuel and motor type and are projected to year 2013. Because the Board’s boating policy is restrictive on fuel and motor type, these numbers will be revisited once the boating policy is in place, and the number of installed facilities adjusted if necessary.

**4.0 Number of Toilets**

The following paragraph describes the number of toilets recommended based on guidelines supplied by each of the following agencies. The calculations below are presented as an example of how to calculate the number of toilets with the appropriate methodology. The proposed number of toilets is subject to change.

**Number of Toilets Required – Method #1**

The U.S. Forest Service guidelines recommend one toilet per 35 persons for camping and picnic areas.

If the maximum daily number of people expected is 2025, then

*Number of Toilets Required = 2025/35 = 58 units based on a maximum daily use*

These guidelines are **not** appropriate for Diamond Valley Lake, as there will be no camping and picnic areas for Phase I.

**Number of Toilets Required – Method #2**

The California Department of Health Services (CDHS) recommends using the following criteria to determine the appropriate number of toilets.

- 50 persons/toilet for picnic areas, playgrounds, beaches and other general use areas
- 20 persons/toilet for camping areas
- 70 persons/toilet for designated shore-fishing areas

Based on the recreation usage described in Section 2.0, the main purpose for providing sanitation facilities is for recreational boating. Therefore, it was decided to use 70 persons/toilet to determine the number of toilets required.

If the maximum daily number of people expected is 2025, then

*Number of Toilets Required = 2025/70 = 29 units based on a maximum daily use*

**Number of Toilets Required – Method #3**

The Riverside County Parks and Open Space District guidelines recommend at least one unisex toilet per 80 visitors.

If the maximum daily number of people expected is 2025, then

*Number of Toilets Required = 2025/80 = 25 units based on a maximum daily use*

**Recommendation**

Based on the two appropriate methods used to calculate the number of toilets, 25-29 toilets were calculated.

It is proposed that 28 units be installed. This will satisfy the CDHS's 70 persons/toilet criteria based on average and maximum daily usage.

## **5.0 Types of Toilets**

### **Water Flush Toilets**

The public prefers water flush toilets. A typical water flush toilet uses approximately 1.5-2 gallons of water per usage. Sewage is collected and sent to either a septic tank or a wastewater treatment facility.

### **Chemical Toilets**

Otherwise known as “porta-potties,” chemical toilets are recommended for limited and seasonal use. Chemical toilets may have the ability to flush, and the sewage is held in a small chamber located above ground, inside the unit. Typically, sewage must be pumped out on a weekly basis.

There are also chemical flush toilets that have an underground vault, which can hold a larger amount of sewage than a “porta-potty.” The U.S. Forest Service, who has extensive experience in sanitation facilities for recreational areas, is phasing out chemical toilets because waste disposal has become increasingly difficult.

### **Vault Toilets**

Vault toilets are recommended for remote areas that normally do not have water and sewer hookups available. Vault toilets do not flush, and sewage is held in an underground vault. Due to the large vault size, sewage does not need to be pumped out as frequently as a chemical toilet, and is able to handle a larger number of uses compared to a chemical toilet.

In addition to standard vault toilets, a vault toilet with an evaporator was also considered. This system uses mechanical ventilation through a solar-powered fan to control odors and increase evaporation, which decreases pumping frequency. Although this patented evaporative vault toilet is approximately 40 percent more expensive than the standard vault, the additional cost is justified by decreased odors and decreased pumping frequency. Therefore, “vault” toilets in this document will presume using the evaporative vault-type toilet.

### **Floating Restrooms**

The California Department of Health Services has published draft guidelines for domestic water supply reservoirs that allow recreational uses. This document states, “Floating restrooms are prohibited unless special approval is obtained from the CDHS.” Other water supply facilities in the state are currently operating with floating toilets under permit from the CDHS.

## **6.0 Site Selection**

The following guidelines should be used to select sanitation sites:

- (1) Provide sanitation facilities for the various recreational uses and areas;
- (2) Keep travel time from any location on the lake to a sanitation facility to 10 minutes or less;
- (3) Sites shall be reasonably accessible and visible.

Based on the recreation usage described in Section 2.0, the main purpose for providing sanitation facilities is for recreational boating. Therefore, it is envisioned that the majority of the sanitation facilities will be placed at the East and West Marinas. There is also a need for a sanitation facility at the end of the pedestrian-only trail for hiking. Other sites are proposed to provide boater access to sanitation facilities. It is thought that each of the boater access sites will use existing construction roads for boaters to access the sanitation facilities from the shore, and that a dock or beachhead will be necessary at the shoreline.

Because DVL will be used as a water storage facility, the amount of water stored in the reservoir will fluctuate dramatically. It is expected that the year-to-year variation in surface elevation of the reservoir will be as great as 10-35 vertical feet. This fluctuating water level will also affect the ease of access to the boater-access sanitation facilities, as the walking distance from the shoreline to the toilets will increase as the water level drops.

Figure 1 shows a conceptual map of all proposed sanitation facilities. Figure 1 also shows that a boater could reach the shoreline access point to the sanitation facility within 5 minutes (assuming a 15-mph speed) from any location on the lake. Figures 2 through 5 show the walking distances from the shoreline to the toilets (at 600,000 and 800,000 acre-feet of storage). Walking distances at these locations range from 150 feet to 535 feet (depending on lake elevation). Assuming a walking speed of 2 mph, an additional travel time of 3 minutes is expected, thus, the total travel time from anywhere on the lake to sanitation facilities is approximately 10 minutes. If it is needed to shorten this travel time, or assume a slower travel time, additional facilities can be added. Any travel time longer than 10 minutes is not recommended.

Table 2 shows the proposed locations of the 28 toilets calculated from Section 4.0. These site locations are subject to change, and are presented to demonstrate that the guidelines for site selection can be met, particularly that a boater can reach a sanitation facility within 10 minutes from any location on the lake.

Table 2: Designation of Toilet Locations for Phase II

<b>Location #/Description</b>	<b># of Toilets</b>	<b>Purpose</b>
#1 – Near Saddle Dam on High Water Road	2	Boating
#2 – North Hills Pedestrian Trail on High Water Road	2	Hiking
#3 – East Marina	12 (Three, 4-unit facilities) ADA accessible with hand washing	General; Boating; Shore-line Fishing; Hiking
#4 – West Marina	8 (Two, 4-unit facilities) ADA accessible with hand washing	General; Boating
#5- Narrow Point of Lake, South Hills on High Water Road	2	Boating
#6 – Near Rawson Canyon on High Water Road	2	Boating
Total	28	

As mentioned earlier, the number of facilities presented is for Phase II. The actual number and location of sanitation facilities for the opening of the lake will be determined based on the ability to construct such facilities by mid-summer 2003.

## 7.0 Design Guidelines

The following are general guidelines for sanitation facilities:

- (1) Permanently installed sumps containing sewage must be double-contained.
- (2) Facilities must be anchored to prevent overturning.
- (3) If a sewage spill were to occur, a dike should be constructed around the sanitation facility perimeter for containment.
- (4) A high-level alarm system shall be placed in the sump to indicate if sewage is near overflow. This alarm will be routed to the Skinner control room, as it is manned 24 hours a day. These can be powered from solar paneling located on the roof of the facility.
- (5) The CDHS sets guidelines for minimum horizontal distances that sanitation facilities must be set away from the high water line, depending on the type of toilet selected.
  - For water flush toilets: 200 horizontal feet away from the high water line
  - For chemical toilets: 50 horizontal feet away from the high water line
  - For vault toilets: 100 horizontal feet away from the high water line

Please see Figures 2 through 5 for location of sanitation facilities and their proximity to the high water road when the water level is at full volume (800,000 acre-feet) and at 600,000 acre-feet.

## 8.0 Maintenance

Sewage will be collected in an above-ground holding tank for chemical toilets, or an underground tank for vault toilets. Sewage will be pumped out as needed to prevent overflowing, excessive odor or other objectionable conditions. Pumping of tanks will be done in such a manner as to prevent spillage. If chemical toilets are used, weekly pump-out is standard. If vault toilets are selected, pump-out once or twice per year is expected.

Facilities will be maintained in a sanitary and aesthetically acceptable condition, on a regularly scheduled basis. The maintenance can be either the responsibility of the marina operator, or contracted out to a sanitation maintenance contractor. It is recommended that facilities be checked on a daily basis year round to ensure that structures are in a state of repair to prevent possible injury to visitors. Tanks shall be inspected for leakage. From March 15 to September 15 they shall be inspected at least twice daily. Toilets shall be cleaned on an as needed basis to maintain them in a sanitary, serviceable, and hazard free condition. A cleaning should occur after the toilets are pumped out to make certain no unsanitary conditions exist as a result of the servicing.

All toilets shall be cleaned and disinfected on all visible interior surfaces including ceiling, walls, floors, seats and lids, urinals and screens. Surfaces shall be left in a dry condition and excessive water shall not be allowed to spill around the structure. All graffiti, insects, nests, dirt, feces, urine or other foreign matter shall be removed from exposed surfaces. Toilet paper, toilet seat covers and other products shall be kept adequately stocked. Litter should be cleaned up within 25 feet of the structure.

If chemical toilets are selected, the monthly rental cost with the sanitation maintenance contractor includes monitoring, maintaining, and cleaning the facility on a weekly basis. Additional costs will be incurred to provide inspection and/or cleaning on a more frequent basis.

Please see Section 10.0 for O & M cost estimates for the various toilet types.

## **9.0 Emergency Response**

If a sewage spill were to occur, Metropolitan's Hazardous Materials Field Coordinator as described in the Hazardous Materials and Waste Emergency Contingency Plan will follow a contingency plan.

The Hazardous Materials Field Coordinator will follow the "Field HazMat Coordinator's Spill Response Flowchart", which describes in condensed form the key conditions that incrementally raise the levels of response and reporting associated with a spill of hazardous materials/waste. It is intended as a checklist for helping to ensure that required remedial actions are taken, and that required reports are prepared.

Some of the essential factors in responding to a sewage spill are:

- (1) Evaluation of the situation
- (2) Isolation of the affected area
- (3) Control of the discharge
- (4) Containment or diversion of the release
- (5) Communication with other affected persons
- (6) Clean-up of spilled materials and site
- (7) Reporting of the incident

## **10.0 Cost Estimates & Evaluation of Alternatives**

The type of toilet selected was based on the evaluation of the following factors:

(1) available infrastructure, (2) risk to water quality, (3) number of uses per toilet, (4) user accessibility, and (5) capital and O & M cost.

Based on this evaluation (Table 3), only chemical toilets and/or vault toilets are recommended for Phase I. Water flush toilets are not a viable option for Phase I because there will not be sufficient infrastructure available. Water flush toilets are recommended to replace the Phase I chemical or vault toilets as infrastructure becomes available.

Floating toilets are not preferred as the California Department of Health Services' guidelines state "floating restrooms are prohibited unless special approval is obtained from the CDHS."

Floating restrooms have the greatest potential risk to water quality while on the lake, and while being maintained. Although floating restrooms have faster boater access than shoreline facilities, as less walking is required to reach the facility, it is exactly this same reason why floating restrooms pose a higher water quality risk. Chemical and vault toilets located along the high water road are recommended based on their minimal risk to water quality. In addition, floating restrooms cannot provide sanitation facilities for other recreational uses such as hiking, due to their inaccessibility from land.

Staff recently visited the Los Vaqueros reservoir, in Brentwood, California, owned by the Contra Costa Water District. Similar to Diamond Valley Lake, Los Vaqueros is a source of domestic water supply, and can experience a 30-40-foot water elevation change. Sanitation facilities for Los Vaqueros include flush toilets at the marinas, and vault toilets placed around the perimeter of the lake for boater, hiker, and shoreline fishing access. Recreators use the facilities, and the sanitation facilities in place are successful in protecting raw water quality.

Table 4 presents four options for sanitation facilities within the watershed, incorporating chemical and vault toilets, their associated capital cost, and the O & M cost assuming a five-year period. These costs do not include the cost to develop an accessible route to each of the sanitation facilities from the shoreline. Unit costs are also listed on Table 4. It should be noted that the additional benefit of installing vault toilets during Phase I is that they can be converted to standard water flush toilets during Phase II, as infrastructure is planned for Phase II.

Option 1 is to install vault toilets at all locations (marinas and along the high water road) to satisfy the recommended 28 numbers of toilets. Option 2 is to install vault toilets at the marinas and renting chemical toilets along the high water road. Option 3 is to rent chemical toilets for the marinas and install vault toilets along the high water road. Option 4 is to rent chemical toilets for all locations.

### **Recommendation**

Four types of sanitation facilities (flush, chemical, vault, and floating) were evaluated for installation at Diamond Valley Lake. Chemical and vault toilets are recommended for Phase I. Water flush toilets are recommended to replace the Phase I chemical or vault toilets as infrastructure becomes available during Phase II.

In order to provide adequate sanitation facilities for the various recreational uses and areas, a total of 28 toilets are proposed within the watershed (Figure 1). The combined capital and O & M cost for a 5-year period for the 28 toilets ranges from \$608,000 to \$788,000. This does not include the cost to develop an accessible route to each of the sanitation facilities from the shoreline.

The actual number and location of sanitation facilities for the opening of the lake will be determined based on the ability to construct such facilities by mid-summer 2003. Due to the phased approach, recreational areas will be opened to the public only as adequate sanitation facilities are provided.

## **11.0 Related Items**

### **Hand Washing**

Hand washing will be provided for sanitation facilities at the marinas only. Hand washing facilities are not recommended for facilities located along the high water road, as they may be used for other purposes, such as fish cleaning. Only a hand sanitizer is recommended for these locations.

**Potable Water for Drinking**

Not provided.

**Boater Access**

It is envisioned that docks or beachheads are needed for boaters to access land-side facilities along the high water road. Weekly maintenance is needed to ensure the dock/beach is properly maintained. Accessibility issues regarding the Americans with Disabilities Act (ADA) are currently being evaluated. The proposed approach will provide an ADA ramp and dock for boater access at two locations, the West Marina and at Location #5 (close to midpoint of lake), as well as ADA restrooms at the East Marina. It is felt that providing ADA access for these three locations that cover the expanse of the lake will be sufficient to meet ADA requirements.

**Maintenance of Roads to Sanitation Facilities**

For land-side facilities located along the high water road, a prepared trail (e.g., gravel, decomposed granite, or asphalt) is needed between the dock and the restroom. When water levels drop, additional site work may be needed to keep the road accessible.

**Trash**

Metropolitan will designate different locations for collection and removal of trash generated at the marinas and at shoreline facilities. It is anticipated that the marina operator will be responsible for collection, storage and removal of solid waste at the marina. Collection, storage, and removal of solid waste at other areas will be the responsibility of the sanitation facilities maintenance contractor. Metropolitan will arrange for periodic clean up in all use areas.

**Maps**

Maps showing the location of sanitation facilities will be provided.

Table 3: Evaluation of Toilet Types

	Water Flush	Chemical	Vault	Floating
Infrastructure Needed	Yes	No	No	No
Risk to Water Quality	Low	Low	Low	Moderate
Number of Uses/Toilet	Unlimited	100	Depends on vendor type (100-11,000)	2,000-3,000
User Accessibility	At marinas – easy; ADA Accessible At HWR – moderate	At marinas – easy; ADA Accessible At HWR – moderate	At marinas – easy; ADA Accessible At HWR – moderate	Easy for boater access/inaccessible for hiking

HWR = High Water Road

ADA = Americans with Disabilities Act

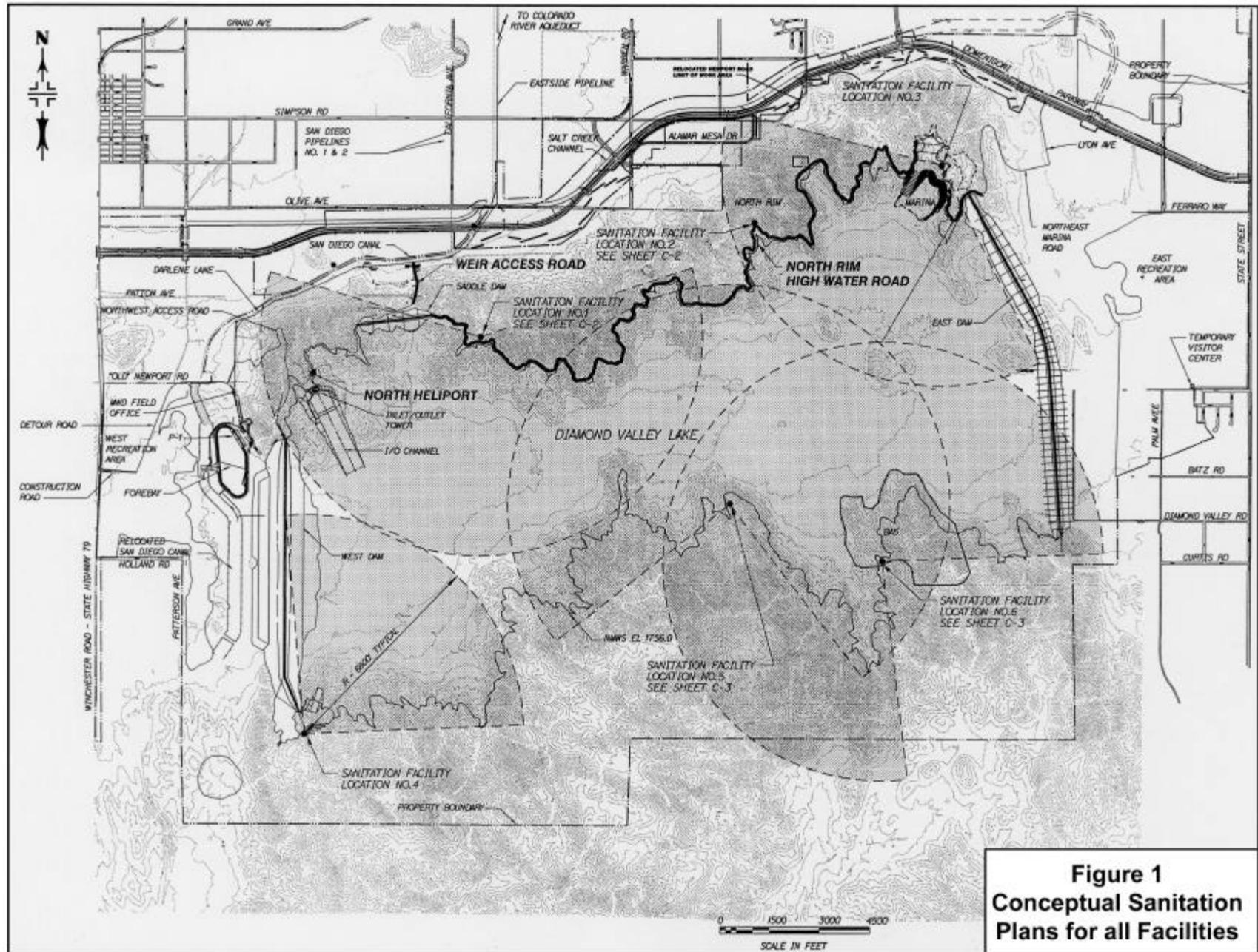
Table 4: Cost Options for Sanitation Plan

Option	1. Vault toilets at both marinas and along HWR*	2. Vault toilets at both marinas and chemical toilets along HWR	3. Chemical toilets at both marinas and vault restrooms along HWR	4. Chemical toilets at marinas and along HWR
Capital Cost (total)	\$648,000	\$500,000	\$148,000	\$0
O & M Cost ( 5-year period)	\$140,000	\$151,000	\$460,000	\$624,000
Total	\$788,000	\$651,000	\$608,000	\$624,000

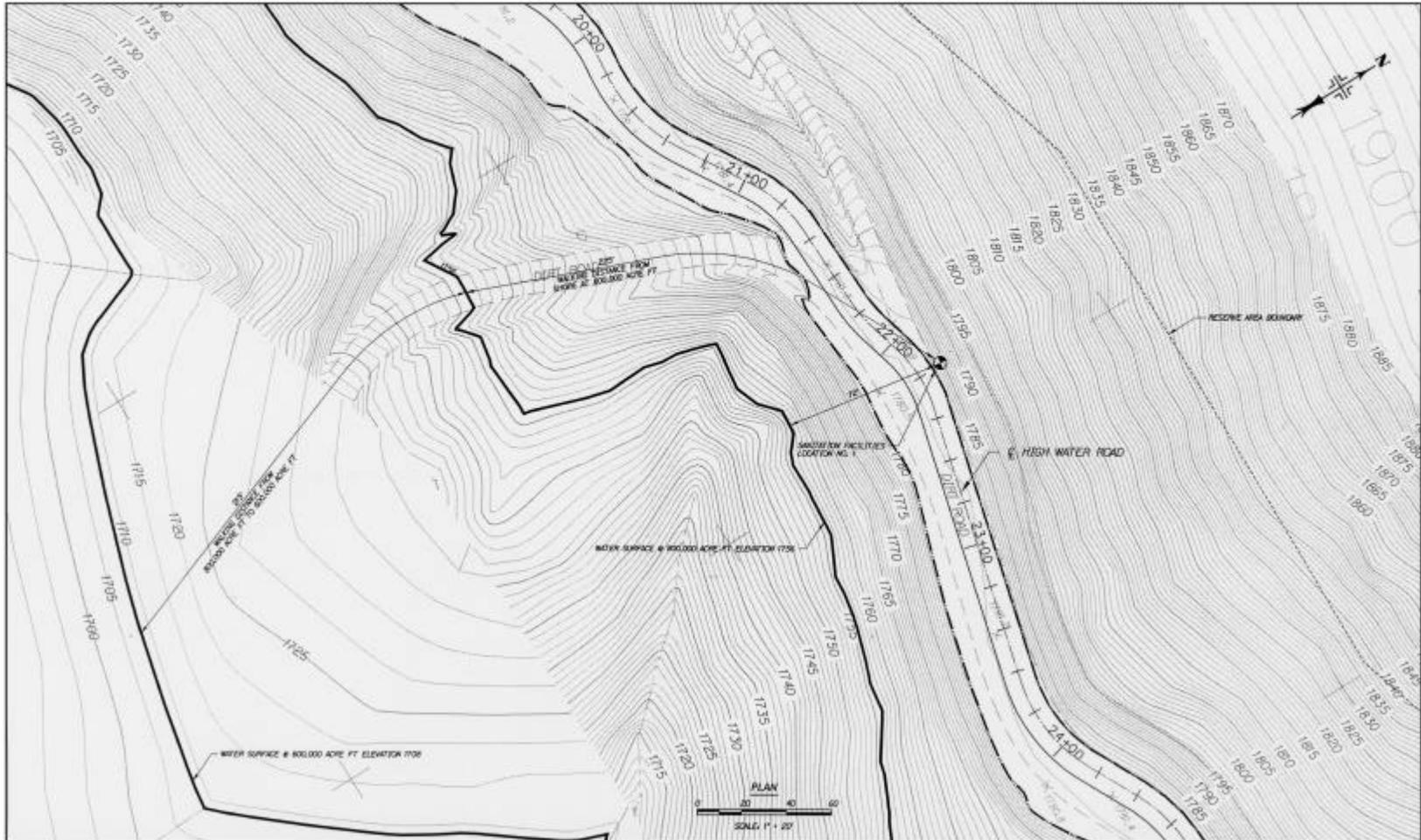
\*High water road

These estimates assume:

- (1) No major excavation or grading is required to prepare or reach the restroom sites;
- (2) The restrooms have no power or water;
- (3) The restrooms are prefabricated building kits;
- (4) O & M costs are over a 5-year period and include cleaning + sewage pump-out;
- (5) Vault restrooms need to be pumped out once a year;
- (6) Weekly cleaning at \$17/unit;
- (7) Unit costs for:
  - 2-unit vault restroom = \$37,000, includes cost of building + labor to excavate & backfill
  - 4-unit vault restroom = \$100,000, includes cost of building + labor to excavate & backfill
  - 2-unit chemical toilet = \$850 monthly rental fee
  - 4-unit chemical toilet = 1,400 monthly rental fee



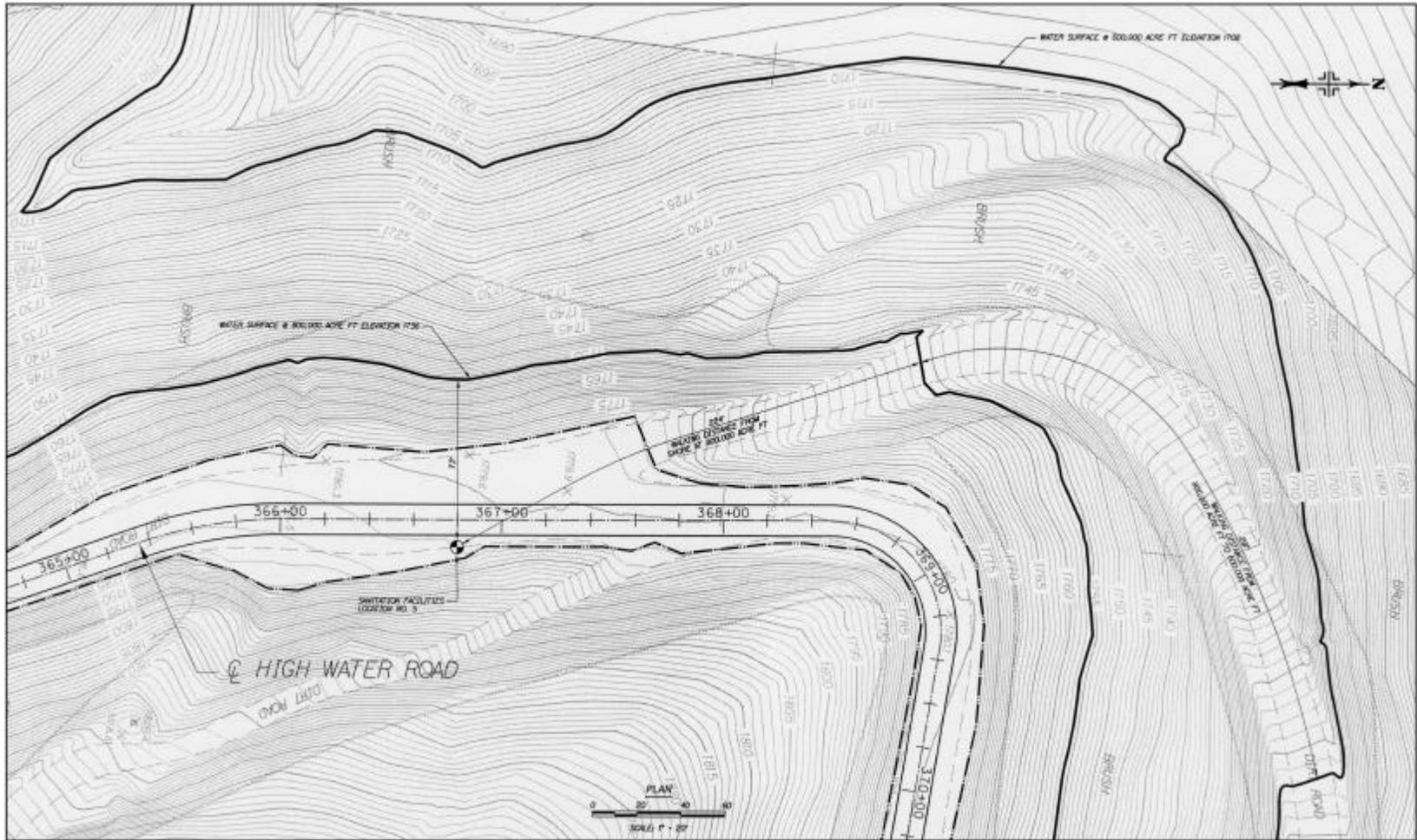
**Figure 1**  
**Conceptual Sanitation**  
**Plans for all Facilities**



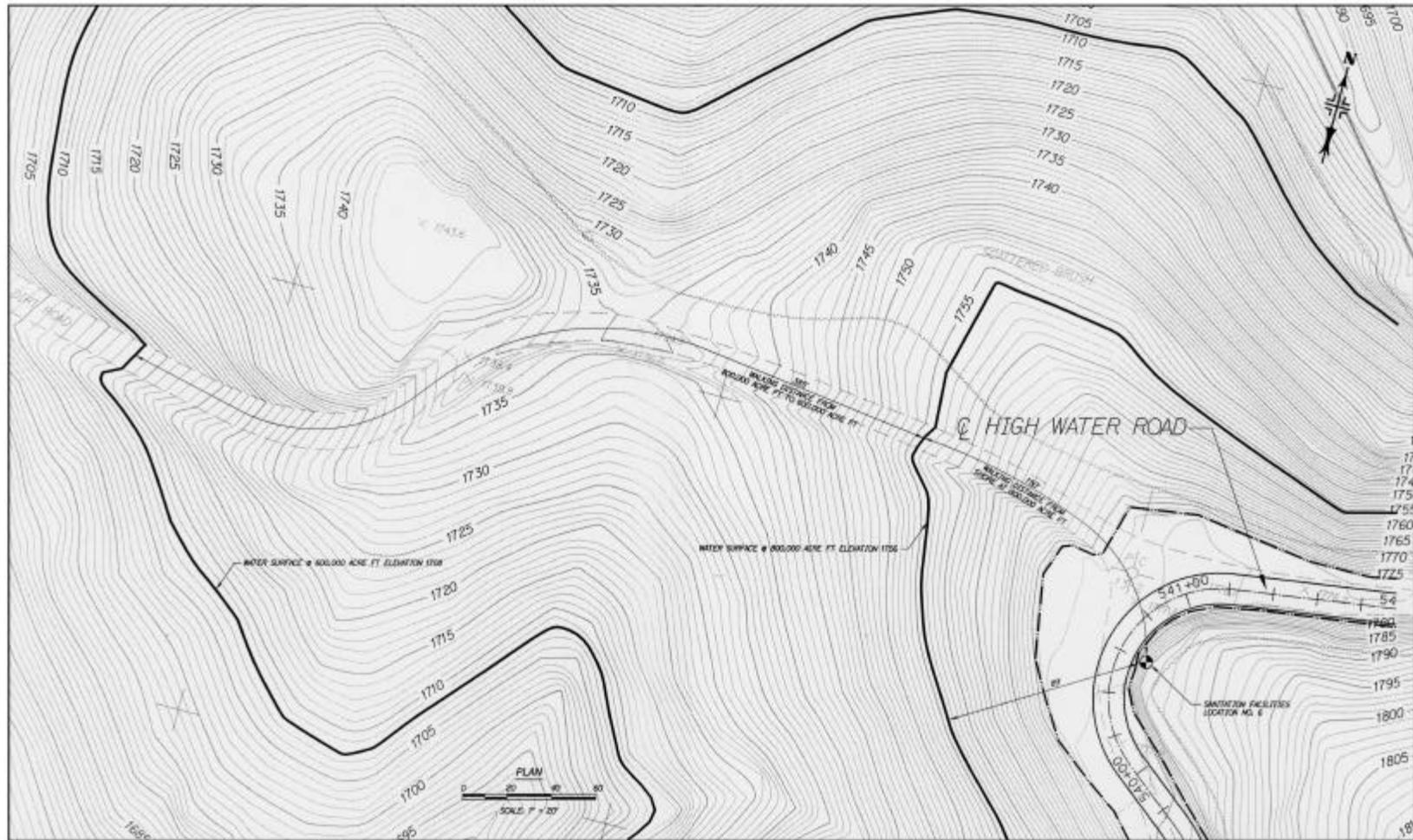
**Figure 2. Conceptual Sanitation Facilities along North Rim - Location No. 1**



**Figure 3. Conceptual Sanitation Facilities along North Rim - Location No. 2**



**Figure 4. Conceptual Sanitation Facilities along South Rim - Location No. 5**



**Figure 5. Conceptual Sanitation Facilities along North Rim - Location No. 6**