



California Regional Water Quality Control Board Lahontan Region



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Arnold Schwarzenegger
Governor

March 13, 2009

TO ALL INTERESTED PERSONS AND AGENCIES:

TENTATIVE UPDATED WASTE DISCHARGE REQUIREMENTS FOR THE RESORT AT SQUAW CREEK IN THE TRUCKEE RIVER HYDROLOGIC UNIT

Enclosed is a tentative updated Waste Discharge Requirement for the Resort at Squaw Creek, Placer County, that regulates discharges of potential pollutants including nutrients from fertilizers, pesticides, and stormwater runoff within the Truckee River Hydrologic Unit. This update (1) changes monitoring associated with golf course management from a broader hydrogeologic characterization of the Squaw Creek meadow system to assessment of potential impacts of golf course management during the active golf season; (2) streamlines the process to approve or prohibit chemicals and allowed management methods, providing more flexibility in golf course management and oversight and more efficient use of Water Board staff and Technical Review Committee resources; (3) removes outdated references to the 1991 California Inland Surface Waters Plan; and (4) requires implementation of Squaw Creek TMDL and Truckee River TMDL bioassessment monitoring and implementation of management practices to reduce sediment loading as appropriate.

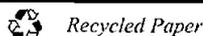
The Water Board requests that you review the enclosed documents consisting of the tentative waste discharge requirements, and the monitoring and reporting program and provide us with your written comments no later than **April 13, 2009**. Comments received after April 13, 2009 cannot be given full consideration in preparing the recommended updated WDR Permit to be presented to the Water Board for adoption. It is proposed to present these requirements to the Water Board for adoption at the meeting set for **May 13 and 14, 2009** in South Lake Tahoe, California.

If you have any questions or comments regarding the enclosed documents you may contact Dr. Bruce Warden, Environmental Specialist III, at (530) 542-5416, or me at (530) 542-5436.

Lauri Kemper
Supervising Engineer, North Lahontan Watersheds Division

BTW/clhT: RASC Updated WDR ltr

California Environmental Protection Agency



....NOTICE....

Submittal of Written Material for Regional Board Consideration

In order to ensure that the Regional Board has the opportunity to fully study and consider written material, it is necessary to submit it at least ten (10) days before the meeting. This will allow distribution of material to the Board Members in advance of the meeting. Pursuant to Title 23 California Code of Regulations Section 648.4, the Regional Board may refuse to admit written testimony into evidence unless the proponent can demonstrate why he or she was unable to submit the material on time or that compliance with the deadline would otherwise create a hardship. If any other party demonstrates prejudice resulting from admission of the written testimony, the Regional Board may refuse to admit it.

A copy of the procedures governing Regional Water Board meetings may be found at Title 23, California Code of Regulations, Section 647 et seq., and is available upon request. Hearings before the Regional Board are not conducted pursuant to Government Code Section 11500 et seq.

Complete Form and Return

TO: California Regional Water Quality Control Board, Lahontan Region

SUBJECT: Comments on Tentative Updated Waste Discharge Requirements for the Resort at Squaw Creek in the Truckee River Hydrologic Unit

- We concur with tentative order
- We concur; comments attached
- We do not concur; comments attached

_____ (Sign)

_____ (Type or print name)

_____ (Organization)

_____ (Address)

_____ (City and State)

_____ (Telephone/Fax)

CALIFORNIA REGIONAL WATER QUALITY CONTROL WATER BOARD
LAHONTAN REGION

BOARD ORDER NO. R6T-2009-(**TENTATIVE**)
WDID NO. 6A318511300

UPDATED WASTE DISCHARGE REQUIREMENTS

FOR

THE RESORT AT SQUAW CREEK

Placer County

The California Regional Water Quality Control Water Board, Lahontan Region (Water Board), finds that:

1. Discharger

The Resort at Squaw Creek is owned by Squaw Creek Associates (SCA), a California General Partnership. Pacific Squaw Creek Inc. (PSC), a California Corporation and subsidiary of HCV Pacific Partners, is the Managing General Partner, and is responsible for the day-to-day affairs of the SCA Partnership. The Resort at Squaw Creek submitted information on March 20, 1986, which constitutes a complete report of waste discharge for Resort at Squaw Creek Golf Course. For the purposes of this Order, the Resort at Squaw Creek is referred to as the "Discharger" and the golf course and its routine operation and maintenance are referred to as the "facility".

2. Permit and Monitoring History

The Water Board adopted Waste Discharge Requirements (WDRs) for the construction of the Resort at Squaw Creek and associated golf course under Water Board Order No. 6-87-102 on September 10, 1987. The Water Board later adopted WDRs for construction and operation of ski facilities under Water Board Order No. 6-90-50 on August 9, 1990. Water Board Order No. 6-93-26 was adopted on April 8, 1993, suspended the previous two Orders, and regulates the operations of the resort, golf course, and ski facilities. Water Board Order No. 6-93-26 has been amended five times (Water Board Order Nos. 6-93-26A1, 6-93-26A2, 6-93-26A3, 6-93-26A4 and 6-93-26A5). This Order updates Water Board Order No. 6-93-26, as amended.

3. Reason for Action

The Water Board is updating waste discharge requirements on its own initiative to streamline requirements and improve the monitoring and reporting program for enhanced protection of water quality. Significant updates in the WDR and associated Monitoring and Report Program (MRP) include:

- a. The original groundwater sampling plan in the MRP was designed primarily to assess the hydrogeologic environment within and adjacent to the Resort at Squaw Creek Golf Course. Both surface water samples and shallow monitoring well samples were taken only in Spring and Fall, which provide little information on immediate impacts of golf course management activities on nearby ground and surface waters. A total of seventeen shallow wells were sampled in Spring and Fall every two years, and a total of fifteen deep wells were sampled in Fall every four years. The WDRs for other local golf courses in the Lake Tahoe watershed of the Lahontan Region emphasize monitoring of chemicals associated with golf course management within the active golf season when fertilizers and herbicides are more likely to be applied, and hence more likely to be leached into groundwater or transported into surface waters. This update will make the Discharger's WDR and MRP consistent with this approach.
- b. The list of "Prohibited and Authorized Chemicals" derived from the Resort at Squaw Creek Technical Review Committee (TRC) Chemical Application Management Plan (CHAMP) has been removed from the WDR and placed in the MRP to allow for more flexibility in golf course management and to allow more efficient use of Water Board and TRC time, since minor changes in golf course management need not come before the Water Board as an amendment, but may be accepted by the Water Board Executive Officer.
- c. The California Inland Surface Waters Plan (1991) is no longer applicable, and has been deleted from the WDR.
- d. This Order implements relevant portions of the Squaw Creek TMDL and Truckee River TMDL. This Order includes bioassessment monitoring requirements and requirements to implement management practices to reduce sediment loading as appropriate.

4. Facility Location

The facility is located in the Truckee River Hydrologic Unit in portions of Sections 30, 31 and 32 of T15N, R16E, and Sections 5 and 6, T15N, R16E, MDB&M, as shown on Attachment "A", which is made a part of this Order.

5. Facility Description

The existing facility consists of a hotel complex consisting of 405 guest rooms, the Plaza Building (restaurants, convention space, retail stores and other "public" space), landscaping and grounds, 48 homesites and an 18-hole golf course located on the hillside and within the 100-year floodplain and wetlands of Squaw Creek. Additionally, the facility includes ski facilities including a lift and runs operated in conjunction with the Squaw Valley Ski Corporation.

Operation and maintenance of the facility includes:

- a. Application of fertilizers and pesticides ("pesticides" include fungicides, herbicides, rodenticides, etc.).
- b. Watering, mowing, maintaining tee boxes, fairways, and greens.
- c. Fueling and maintenance of equipment.
- d. Maintaining roads, golf cart paths, ski runs, bridges, ski lifts, parking lots and drainage facilities.
- e. Site landscaping and minor improvements.

6. Potential Pollutants

Potential pollutant discharge from golf course operations primarily consists of nutrients from fertilizers, and toxic compounds from the use of pesticides, and diesel fuel from the two 500-gallon above-ground fuel tanks and the waste oil storage tank. Other discharges from facility operations may include: sodium chloride (salt) as a snow conditioner, waste earthen materials from ski slopes, other previously disturbed areas lacking vegetation and unpaved access roads; chemicals used in ski slope preparation; stormwater runoff from impervious surfaces and road sanding materials; oil and grease and litter disposed in parking areas. For purposes of this Order, waste earthen materials are defined as any drainage, flow, or seepage containing eroded earth from any human-disturbed areas or as a result of human activities.

7. Chemical Application Management Plan (CHAMP)

The CHAMP was developed for the operation and maintenance of the golf course. It provides the basis for the use of fertilizers and chemicals on the golf course. The legal requirements for the preparation and content of the CHAMP were set forth in the project approval conditions established by Placer County and the Water Board, as well as in two written agreements which resolved separate lawsuits related to the Resort at Squaw Creek Project. This document, which has been reviewed and recommended by the Technical Review Committee (TRC), was approved and accepted by Placer County on July 16, 1991 and by the Water Board, on September 12, 1991. It is periodically updated to incorporate new operation and maintenance measures, including the use of different fertilizers and pesticides. The TRC reviews and considers all changes in chemical use. The previous WDRs required all changes to be considered and accepted by the Water Board through a formal amendment of the WDRs. This Order allows the Water Board Executive Officer to accept changes through a revision to the Monitoring and Reporting Program after approval by the TRC.

8. Spill Contingency Plan

As part of the CHAMP (Monitoring and Reporting Program Attachment 1), the Discharger prepared a Spill Contingency Plan for the golf course operation which will be followed in the event of any spill of petroleum products or any hazardous material to contain, ensure the rapid cleanup, and minimize the effects of any spill.

9. Land Treatment System

Runoff from the Resort complex drains to two ponds and an artificial wetlands constructed as part of the project which provides partial treatment of the runoff. Runoff from the ponds is discharged to a meandering channel within the existing wetlands before finally discharging to Squaw Creek below the project. Additional wetlands were created within the 100-year floodplain of Squaw Creek to mitigate and to treat runoff from the golf course. The Discharger has an ongoing program to minimize disturbance of natural vegetation and to use best management practices such as revegetation and maintenance of disturbed areas, mechanical stabilization, water bars, drop inlets and other sediment control measures to prevent waste earthen materials from the ski area from entering surface waters. The Discharger has installed and maintains stormwater runoff treatment facilities for its parking area and other impervious surfaces. Treatment facilities consist of drop inlet structures and maintenance consists of cleaning out drop inlet structures and sweeping of the parking area.

10. Snow Disposal/Storage

Snow from parking areas is disposed and stored in mounds around the perimeter of the parking lot. Snowmelt runoff discharges to the two ponds and the artificial wetland.

11. Site Hydrology/Geology

Runoff from the project site will enter ground and surface waters (Squaw Creek) of the Truckee River Hydrologic Unit. Ground water in the vicinity of the facility in the shallow aquifer is about 10 feet below the surface and flows in a generally northerly direction toward Squaw Creek. Ground water in a lower aquifer is about 40 feet below the surface (with a piezometric surface about 10 feet below the ground surface) and flows generally in an easterly direction toward the lower end of the meadow.

12. Water Supply

The facility's current irrigation and domestic water source are Resort at Squaw Creek private production wells and Squaw Valley Mutual Water Company, respectively.

13. Basin Plan

The Water Board adopted a Water Quality Control Plan (Plan) for the Lahontan Region, including the Tahoe Basin March 31, 1995. This Order implements the Plan as amended. The Plan contains water quality objectives for the Truckee River and its tributaries.

14. Beneficial Uses - Surface Water

The beneficial uses of surface waters of Squaw Creek, its tributaries, and Squaw Valley Meadow Wetlands, as set forth and defined in the Plan are:

- a. Municipal and domestic supply
- b. Agricultural supply
- c. Water contact recreation
- d. Ground water recharge
- e. Water contact recreation
- f. Non-contact water recreation
- g. Commercial and sportfishing
- h. Cold freshwater habitat
- i. Wildlife habitat
- j. Rare threatened or endangered species
- k. Migration of aquatic organisms
- l. Spawning reproduction and development
- m. Water quality enhancement
- n. Flood peak attenuation/flood water storage

15. Beneficial Uses - Ground Water

The beneficial uses of ground waters of the Olympic Valley in the Truckee River Hydrologic Unit, and Department of Water Resources Groundwater Basin No. 6-108, as set forth and defined in the Plan are:

- a. Municipal and domestic supply
- b. Agricultural supply
- c. freshwater replenishment to surface waters

16. Policy for Maintaining High Quality Waters

State Water Resources Control Water Board Resolution No. 68-16 requires the Water Board, in regulating the discharge of waste, to (a) maintain existing high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses, and will not result in water quality less than that described in State or Regional Water Board policies; and (b) require that any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

The facility has two primary pathways for discharging potential pollutants: surface runoff and irrigation. Surface runoff enters Squaw Creek from treatment ponds and a wetlands system that flows through the golf course. Waste discharges may enter shallow groundwater through percolation of irrigation or storm water. Water quality sampling from previous years indicates no degradation of surface or ground water quality. The continued waste discharges appear to be adequately treated by existing control measures. The existing and ongoing activities and control measures (BMPs and treatment measures) will meet the waste discharge requirements and result in best practicable treatment or control of the discharge necessary to assure that (a) pollution or nuisance will not occur and (b) the highest quality water will be maintained.

17. Other Considerations and Requirements for Discharge

Pursuant to California Water Code section 13241 the requirements of this Order take into consideration:

(a) Past, present, and probable future beneficial uses of water.

This Order identifies past, present and probable future beneficial uses of water as described in Finding nos. 14 and 15. The ongoing discharges from the facility will not adversely affect present or probable future beneficial uses of water.

(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.

Finding no. 11 describes the environmental characteristics of the hydrographic unit. The quality of groundwater is generally excellent and is used for drinking water supply. Surface water quality is generally good with the exception of elevated sediment levels which were identified in the Water Board's Clean Water Act Section 303 (d) list of impaired waterbodies.

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area.

Two TMDLs have recently been adopted to reduce sediment loading to Squaw Creek. This Order requires continued use of BMPs, maintenance of stormwater controls, etc. Continued sediment reductions in the Squaw Creek watershed are anticipated through the implementation of the TMDLs including specific requirements contained in individual facility waste discharge requirements and in Placer County's municipal storm water permit. Additionally, monitoring requirements in this Order and other orders for discharges in the watershed will effectively document improvements in watershed function anticipated to occur as

a result of decreased sediment loading. Water quality is improving in response to TMDL implementation and enforcement actions.

(d) Economic considerations.

This Order regulates an existing facility with existing control measures. This Order continues to require operation and maintenance of control measures. Monitoring requirements have been modified. Costs associated with assessment of golf course operation impacts to surface and ground waters will not be substantially different. Costs for bioassessment and streambed sediment monitoring required under the TMDL are new, but will be minimized if costs are shared by the other three regulated facilities sharing sediment load reductions allocations in the Squaw Creek drainage.

(e) The need for developing housing within the region.

This is an existing facility and will not require current or future housing.

(f) The need to develop and use recycled water.

The Discharger does recycle some ground and surface waters through pumping of irrigation water from pond A, which collects some local tail water and receives some groundwater recharge. Irrigation application is conducted at or below evapotranspiration (ET) rates to minimize the potential for contaminants entering the pond or local surface or ground waters.

18. CEQA Compliance

The continued operation of this existing facility with minor modifications under these revised waste discharge requirements are exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000 et seq.) in accordance with Title 14, California Code of Regulations, Section 15.

19. Notification of Interested Parties

The Water Board has notified the Discharger and interested parties of its intent to update waste discharge requirements for the discharge.

20. Consideration of Public Comments

The Water Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED THAT THE DISCHARGER SHALL COMPLY WITH THE FOLLOWING:

I. DISCHARGE SPECIFICATIONS

A. Effluent Limitations

- a. All surface flows generated within the facility, which are discharged to surface waters shall not contain the following:
- b. Substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, or animal life; and
- c. Coliform organisms attributable to human wastes.

B. Effluent and Receiving Water Limitations

- 1. The discharge of surface flows generated within the facility, to surface waters or municipal stormwater collection systems within the Squaw Creek drainage of Truckee River Basin shall not exceed 2.0 mg/L for Grease and Oil, nor shall it exceed the following values nor cause the following receiving water quality objectives to be exceeded:

Constituent	Units	Annual Mean Concentration
Total Dissolved Solids	mg/l	85
Chloride	mg/l	3.0
Sulfate	mg/l	25.0
Total Nitrogen	mg/l as N	0.18
Total Kjeldahl Nitrogen	mg/l as N	0.13
Nitrate plus Nitrite	mg/l as N	0.05
Total Phosphorus	mg/l as P	0.02
Total Iron	mg/l as Fe	0.13

If constituent concentrations of waters entering the facility exceed the numerical limitations specified above there shall be no increase in the constituent concentrations in the waters that are discharged from the facility.

2. The discharge of water from the facility to surface and ground waters, including percolating waters from irrigation, shall not cause violation of the following objectives:
 - a. Ammonia - The concentrations of un-ionized ammonia (NH_3) or total ammonium ($\text{NH}_3 + \text{NH}_4$) at ambient water temperature and pH in receiving waters, shall not exceed the corresponding water quality objectives given in Attachment C taken from the Basin Plan, which is made part of this permit.
 - b. Bacteria - Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. *The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.*
 - c. Biostimulatory Substances - Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.
 - d. Chemical Constituents - Waters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 64444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect. Waters designated as AGR shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes). Waters shall not contain concentrations of chemical

constituents in amounts that adversely affect the water for beneficial uses.

- e. Chlorine, Total Residual - For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 mg/L or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.
- f. Color - Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.
- g. Dissolved Oxygen - The dissolved oxygen concentration, as percent saturation, shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation. For waters with the beneficial uses of COLD, COLD with SPWN, WARM, and WARM with SPWN, the minimum dissolved oxygen concentration shall not be less than that specified in Table 3-6 of the Basin Plan.
- h. Floating Material - Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses. For natural high quality waters, the concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.
- i. Oil and Grease - Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses. For natural high quality waters, the concentration of oils, greases, or other film or coat generating substances shall not be altered.
- j. Nondegradation of Aquatic Communities and Populations - All wetlands shall be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants; or which lead to the presence of undesirable or nuisance aquatic life. All wetlands shall be free from activities that would substantially impair the biological community as it naturally occurs due to physical, chemical and hydrologic processes.

- k. Pesticides –As defined in CA Agriculture Code 12753, pesticides include insecticides, herbicides, rodenticides, fungicides, piscicides and all other economic poisons, which is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi or weeds capable of infesting or harming vegetation, humans, or animals. Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There shall be no detectable increase in bioaccumulation of pesticides in aquatic life. Waters designated as MUN shall not contain concentrations of pesticides or herbicides in excess of the limiting concentrations specified in Table 64444-A of Section 64444 (Organic Chemicals) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.
- l. pH – In fresh waters with designated beneficial uses of COLD, changes in normal ambient pH levels shall not exceed 0.5 pH units. For all other waters, the pH shall not be depressed below 6.5 nor raised above 8.5.
- m. Radioactivity – Radionuclides shall not be present in concentrations which are deleterious to human, plant, animal, or aquatic life or which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.
- n. Sediment - The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.
- o. Settleable Materials - Waters shall not contain substances in concentrations that result in the deposition of materials that cause nuisance or adversely affect the water for beneficial

uses. For natural high quality waters, the concentration of settleable materials shall not be raised by more than 0.1 milliliters per liter.

- p. Suspended Materials - Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.
- q. Tastes and Odors - Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. For naturally high quality waters, the taste and odor shall not be altered.
- r. Temperature - The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the Water Board that such an alteration in temperature does not adversely affect the water for beneficial uses. For waters designated WARM, water temperature shall not be altered by more than five degrees Fahrenheit (5_F) above or below the natural temperature. For waters designated COLD, the temperature shall not be altered. Temperature objectives for COLD interstate waters and WARM interstate waters are as specified in the "Water Quality Control Plan for Control of Temperature in The Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" including any revisions. This plan is summarized in Chapter 6 (Plans and Policies), and included in Appendix B.
- s. Toxicity - All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. *Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration and/or other appropriate methods as specified by the Water Board.* The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for

“experimental water” as defined in *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al. 1998).

- t. Turbidity - Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.
4. The discharge of water from the facility to surface and ground waters, including percolating waters from irrigation, shall not cause violation of the following objectives:
 - a. In ground waters designated as MUN, the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 milliliters.
 - b. Chemical Constituents - Ground waters designated as MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 64444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect. Waters designated as AGR shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes). Ground waters shall not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.
 - c. Radioactivity - Ground waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

- d. Tastes and Odors - Ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For ground waters designated as MUN, at a minimum, concentrations shall not exceed adopted secondary maximum contaminant levels specified in Table 64449-A of Section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and Table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels- Ranges) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

C. Best Management Practices

1. The Dischargers must comply with the Best Management Practices for operation of the golf course as listed in Monitoring and Reporting Program Attachment 1. These practices, modified as noted to conform to the Water Board's statutory authority, are extracted from the CHAMP. Nothing in this Order shall abrogate the authority of the Technical Review Committee (TRC) or the Placer County Department of Environmental Health (DEH) as defined in the CHAMP, in Placer County approvals, or in the two written agreements which resolved separate lawsuits related to the Resort at Squaw Creek project.
2. Unless a variance has been granted pursuant to the Provisions, there shall be no removal of vegetation nor disturbance of existing ground surface conditions between October 15 of any year and May 1 of the following year.
3. Prior to any disturbance of existing soil conditions, the Discharger shall install temporary erosion control facilities to prevent transport of eroded earthen materials and other wastes off the property.
4. Vehicle use shall be restricted to existing roads and previously disturbed areas.
5. There shall be no significant modification of existing drainage ways or existing stream channel geometry except for the purpose of stabilization or enhancement of water quality improvement effects. All modifications of the bed, channel, or bank of a stream require a

- prior written agreement with the California Department of Fish and Game
6. All eroding slopes steeper than two horizontal to one vertical shall be stabilized.
 7. All soil disturbance activities shall cease and temporary erosion control measures immediately installed if adverse weather conditions threaten the transport of disturbed soils from the project site.
 8. Prior to October 15 of each year, the Discharger shall provide permanent or temporary stabilization of all disturbed or eroding areas through commencement of revegetation and/or completion of mechanical stabilization measures. Commencement of revegetation shall consist of seeding, planting, mulching, initial fertilization as needed, and initial watering as needed.
 9. Surface flows from the project site shall be controlled so as to not cause downstream erosion at any point.
 10. Stormwater runoff handling and disposal facilities shall be cleaned and renovated annually.
 11. All disturbed areas shall be adequately restabilized or revegetated. Revegetated areas shall be continually maintained in order to assure adequate growth and root development until vegetation becomes established. When applicable, the following mitigation measures may be implemented:
 - a. Depending on the level of disturbance, wood fiber mulch or pine needles may be applied on disturbed surfaces in lieu of vegetation;
 - b. Tackifier or rice straw shall not be applied within 100 feet of the high water line;
 - c. Whenever practical seeds collected from the project site area should be added to the seed mix being applied during revegetation; and
 - d. Whenever practical, natural revegetation will be the preferred and most utilized method of stabilization.
 12. There shall be no significant modification of existing drainage ways or existing stream channel geometry except to stabilize erosion or

enhance water quality. All modifications of the bed, channel or bank of stream require prior written approval from the California Department of Fish and Game and all others appropriate state and federal agencies.

13. All slopes subject to erosion shall be stabilized.
14. All loose piles of soil, silt, clay, sand, debris, or other earthen materials shall be protected in a reasonable manner to prevent the discharge of these materials to waters of the State.
15. Dewatering shall be done in a manner so as to eliminate discharge to surface waters. A separate NPDES Permit may be required for dewatering discharges to surface waters.
16. To the extent feasible, stormwater runoff collection, treatment, and/or infiltration disposal facilities shall be designed, installed, and maintained to dispose or treat the effluent to meet effluent and receiving water limitations above for a discharge of stormwater runoff from at least a 20-year, 1-hour design storm (approximately 1" of rainfall) from all impervious surfaces.
17. Surface flows from the facility shall be controlled to not cause downstream erosion at any point. All storm water runoff which leaves the site shall be discharged to a storm drain or stabilized drainage.
18. Dust shall be controlled to prevent the transport of such material off the project site, into any surface water, or into any drainage course.
19. Erosion control facilities shall be installed in conjunction with a routine maintenance and inspection program to provide continued integrity and proper performance of erosion control facilities. Stormwater runoff handling and disposal facilities shall be inspected annually and cleaned and renovated as needed.
20. Snow storage and disposal shall be separated from surface waters and contained to avoid surface runoff.
21. At or before completion of a construction project, all surplus or waste earthen materials shall be removed from the project site and deposited only at a legal, authorized point of disposal or restabilized onsite in accordance with erosion control plans previously approved by the Executive Officer.

22. At no time shall waste earthen materials be placed in surface water drainage courses, or in such a manner as to allow the discharge of such materials to adjacent undisturbed land or to any surface water drainage course.
23. Fresh concrete or grout shall not be allowed to contact or be discharged to surface waters.
24. The Discharger shall immediately clean up and transport to a legal disposal site any spilled petroleum products or petroleum-contaminated soils to the maximum extent practicable.
25. Construction activities that involve crossing or alteration of a stream channel shall be timed to occur during the period of the year in which stream flow is expected to be lowest.
26. Drainage swales disturbed by construction activities shall be stabilized by appropriate soil stabilization measures to prevent erosion.

D. General Requirements and Prohibitions

1. The discharge of treated or untreated domestic wastewater, industrial waste, garbage or other solid wastes, or any deleterious material to surface or ground waters of the Truckee River Hydrologic Unit is prohibited.
2. The discharge or threatened discharge, attributable to human activities, of solid or liquid waste materials including soil, silt, clay, sand, and other organic and earthen materials to surface waters of the Truckee River Hydrologic Unit or within the 100-year floodplain of any tributary to the Truckee River is prohibited.
3. The discharge of oil, gasoline, diesel fuel, petroleum derivative, or any other toxic chemical or hazardous waste is prohibited.
4. The discharge of waste shall not cause a pollution or nuisance as defined in Section 13050 of the California Water Code or a threatened pollution.
5. The Discharger shall at all times fully comply with the engineering plans, specifications, and technical reports submitted with the completed report of waste discharge.

II. PROVISIONS

A. Rescission of Previous Order

Water Board Order No. 6-93-26 and all amendments 6-93-26A1 through A5 are hereby rescinded.

B. Monitoring and Reporting

Pursuant to the California Water Code 13267(b), the Discharger(s) shall comply with Monitoring and Reporting Program No. (TENTATIVE).

C. Notification of Discharge

The Discharger shall immediately notify the Water Board by telephone whenever an adverse condition occurs as a result of any discharge from this facility; written confirmation shall follow within two weeks of the date of violation. An adverse condition includes, but is not limited to, serious violation or serious threatened violation of waste discharge requirements, significant spills of petroleum products or toxic chemicals, or serious damage to control facilities that could affect compliance.

D. Reporting Changes in Project

Any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Water Board at least 90 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances, all proposed expansion projects, increase in impervious surface coverage, or any change in drainage characteristics at the Facility.

E. Water Board Prerogative in Changing the Order

The Water Board reserves the privilege of changing all or any portion of this Order upon legal notice to and after opportunity to be heard is given to all concerned parties.

F. Scope of Applicable Waterways

"Surface waters" and "receiving waters", as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses, wetlands, and natural lakes.

G. Change of Ownership

The owners of property subject to waste discharge requirements shall be considered to have a continuing responsibility for ensuring compliance with applicable waste discharge requirements in the operations or use of the owned property. Any change in the ownership and/or operation of property subject to waste discharge requirements shall be reported to the Water Board. Notification of applicable waste discharge requirements shall be furnished to the new owners and/or operators and a copy of such notification shall be sent to the Water Board.

H. Reports and Time Schedule

The use of fertilizers and pesticides is restricted to the specific types described in the CHAMP. Any proposed changes in the types of fertilizers or pesticides must be reported to the Executive Officer 90 days prior to its proposed use.

I. Standard Provisions

See Standard Provisions, Attachment B.

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Water Board, Lahontan Region, on May 13, 2009.

HAROLD J. SINGER
EXECUTIVE OFFICER

Attachments: A: Location Map
 B: Standard Provisions

ATTACHMENT A

ATTACHMENT B

ATTACHMENT "B"

STANDARD PROVISIONS

1. **Duty to Comply**

The Discharger must comply with all of the conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

The discharge shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this permit has not yet been modified to incorporate the requirements.

2. **Permit Actions**

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit conditions.

If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified, or revoked and reissued to conform to the toxic effluent standard or prohibition, and the Discharger so notified.

3. **Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate**

The Discharger shall take all responsible steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems, installed by a Discharger when necessary to achieve compliance with the conditions of this permit.

6. Property Rights

This permit does not convey any property rights of sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State, or local laws or regulations.

7. Duty to Provide Information

The Discharger shall furnish the Regional Water Board, State Water Board, or EPA, within a reasonable time, any requested information to determine compliance with this permit. The Discharger shall also furnish, upon request, copies of records required to be kept by this permit.

8. Inspections and Entry

The Discharger shall allow the Regional Water Board, State Water Board, or EPA, and local storm water management agency, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter upon the Discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this permit;
- b. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and
- c. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment) that are related to or may impact storm water discharge.
- d. Sample or monitor at reasonable times for the purpose of ensuring permit compliance.

9. Signatory Requirements

- a. All Notices of Intent submitted to the Regional Board shall be signed as follows:

1. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (2) the manager of the construction activity if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
 2. For a partnership or sole proprietorship: by a general partner or the proprietary, respectively; or
 3. For a municipality, State, Federal, or other public agency: by either a principal executive officer, ranking elected official, or duly authorized representative. The principal executive office of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).
- b. All reports, certifications, or other information required by the permit and requested by the Regional Water Board, State Water Board, EPA, or local storm water management agency shall be signed by a person described above or duly authorized representative. A person is a duly authorized representative if:
1. The authorization is made in writing by a person described above and retained as part of the Storm Water Pollution Prevention Plan.
 2. The authorization specifies either an individual or a position having responsibility for the overall operation of the construction activity, such as the position of manager, operator, superintendent, or position equivalent responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

10. Certification

Any person signing documents under Provision 9 shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false

information, including the possibility of fine and imprisonment for knowing violations."

11. Penalties for Falsification of Reports

Section 309 (c) (4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this general permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine or not more than \$10,000 or by imprisonment for not more than two years or by both.

12. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Discharger from any responsibilities, liabilities, or penalties to which the Discharger is or maybe subject under Section 311 of the CWA.

13. Severability

The provisions of this permit are severable, and, if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

14. Reopener Clause

This general permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations 122.62, 122.63, 122.64, and 122.65. If there is evidence indicating potential or actual impacts on water quality due to any storm water discharge, associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or an alternative general permit, or this permit may be modified to include different limitations and/or requirements.

15. Penalties for Violations of Permit Conditions

- a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this permit is subject to civil penalty not to exceed \$25,000 per day of violation, as well as other appropriate sanction provided by Section 309 of the CWA.

- b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties which in some cases are greater than those under the CWA.

16. Availability

A copy of this permit shall be maintained at the construction site during construction and be available to operating personnel.

17. Transfers

This permit is not transferable. A new owner/developer of an ongoing construction activity must submit a Notice of Intent (NOI) in accordance with the requirements of this permit to be authorized to discharge under this permit. An owner/developer who terminates all interest in the property (by sale of this property, or termination of contracts) shall inform the new/owner developer of the duty to file a NOI and shall provide the new owner/developer with a copy of this permit.

18. Continuation of Expired Permit

This permit continues in force and effect until a new general permit is issued or the Regional Board rescinds this permit. Only those Dischargers authorized to discharge under the expiring permit are covered by the continued permit.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LAHONTAN REGION

MONITORING AND REPORTING PROGRAM 6-09-(**TENTATIVE**)
UPDATED WASTE DISCHARGE REQUIREMENTS

FOR

THE RESORT AT SQUAW CREEK

Placer County

This Monitoring and Reporting Program is established to assure optimal management of potential water pollutants from the golf course chemical application and irrigation practices. It is designed to track seasonal and long-term trends in transport of chemicals and associated transformation products to waters of the State. This includes potential pollutants of surface waters and ground waters, whether originating from fertilizer, pesticides, herbicides, fungicides, petroleum products, or other factors related to golf course use and management, including sediment from accelerated erosion from anthropogenic sources.

Chemical use and irrigation shall conform with the Chemical Application Management Plan (CHAMP) in Attachment 1. Before implementing any change in golf course chemical and irrigation management, the Executive Officer must be notified 90 days prior to proposed changes to allow for the modification of the Monitoring and Reporting Program .

I. MONITORING

A. Erosion and Runoff Controls

The Dischargers shall inspect the facility site monthly during those months in which ground cover by snow is not complete. The purpose of this investigation is to discover potential erosion and surface runoff problems on the project site so that corrective measures may be immediately undertaken. Records of problems identified and corrective measures taken shall be kept at the facility.

This inspection shall include:

1. Infiltration Trenches (if applicable)
 - a. Clogging of inlet pipes by debris
 - b. Accumulation of sediment
 - c. Disrepair of trenches

- d. Runoff movement into infiltration trenches
 - e. Damage by vehicles
 - 2. Drop Inlets
 - a. Clogging by debris, ice, or sediment
 - b. Runoff movement into the infiltration gallery
 - c. Damage by vehicles or snow plow equipment
 - 3. Drainage Collection System
 - a. Clogging by debris, ice, or sediment
 - b. Free movement of water through pipes, channels, and appurtenances
 - c. Damage
 - d. Eroding channels
 - 4. Erosion Control
 - a. Health and productive vegetation
 - b. Gully or rill erosion on slopes
 - c. Sediment buildup at toe slopes
 - d. Vegetation damage by vehicles or heavy foot traffic
 - e. Bare areas in need of revegetation
 - f. Traffic and parking restrictions in place
 - 5. Sedimentation Ponds/Storm Water Treatment Wetlands
 - a. Eroding banks
 - b. Accumulation of sediment or solid waste material
 - c. Vegetative condition
- B. General Maintenance and Operations
 - 1. Maintenance and Hazardous Material Storage Areas
 - a. Evidence of spilled oil, gasoline, diesel fuel or any other hazardous materials
 - b. Damage to any hazardous material storage or containment structures
 - c. Spill absorbent material available
 - 2. Chemical Use (Fertilizer and Pesticide, including herbicides and fungicides)

Records shall be kept on an ongoing basis of the following items:

a. Product Purchased

- (1) Each type of product purchased
- (2) Amount of each type of chemical purchased
- (3) Place of purchase
- (4) Date of arrival of chemicals purchased
- (5) Onsite storage location of chemicals purchased
- (6) Manufacturer's label and Material Safety Data Sheet (MSDS)

b. Chemical Application

- (1) Types of chemical applied
- (2) Locations of application
- (3) Dates of application
- (4) Amounts of application
- (5) Method of application
- (6) Name of person(s) responsible for application

3. Irrigation

The CHAMP will contain a schedule for routine irrigation and application of chemicals. This schedule is considered adequate advanced notification. Water Board staff must be notified in advance of any changes to that schedule or non-routine applications.

C. Squaw Creek TMDL Monitoring

The Discharger is required to conduct monitoring as described in Sampling and Analysis Requirements Numeric Target Monitoring, Squaw Creek Total Maximum Daily Load for Sediment, Placer County, 3-19-08, Lahontan Regional Water Quality Control Board (Attachment 3). The numeric target monitoring must be conducted at three locations in Squaw Creek's meadow reach every two years. The scope of monitoring includes benthic macroinvertebrate biomonitoring and assessment of streambed characteristics such as median (D-50) particle size and percent sand and percent fines.

The four facilities required to perform this monitoring hold waste discharge requirements (WDRs) with sediment and erosion control provisions in the Squaw Creek watershed-Intrawest/Squaw Village Neighborhood Company, Placer County, the Resort at Squaw Creek, and the Squaw Valley Ski Corporation. A coordinated monitoring effort is encouraged, as was discussed in the April 17,

2008 meeting between Water Board staff and the four dischargers. If a coordinated monitoring program is pursued, submission of one set of data will suffice to satisfy the reporting requirements of all four WDRs. There is no requirement for coordination, but the monitoring costs would be substantially reduced overall if a coordinated monitoring program is implemented.

Monitoring is to commence in 2009, and is to be conducted every other year. Sampling is to occur in late June or early July (approximately 6/20 - 7/10), in accordance with flow conditions specified in Attachment 3. Reports are due January 15 of every even year (approximately 6 months following the monitoring).

D. Groundwater Monitoring

1. Goals of the Groundwater Sampling Program: (1) establish baseline conditions in early spring; (2) monitor the effects of chemicals applied during the active (summer) season; (3) determine residual effects once the active season has ceased; (4) build a database adequate to provide effective feedback for golf course chemical and irrigation management with respect to environmental protection; and (5) Five shallow wells shall be monitored. Ideally one upgradient well (range 1-2), two mid-course wells (range 1-3, and two downgradient wells (range 1-3). Monitoring wells locations are to be determined in consultation with Regional Board staff and the TRC. No wells shall be selected that are directly influenced by losing reaches of surface water. Well location may vary seasonally, but must characterize as much as possible, potential impacts of application of golf course fertilizers and chemicals on groundwater. Additionally, monitoring of shallow wells will act essentially as sentinel wells for the deeper aquifer, which is used for local drinking water. Any significant increase in chemical constituents detected in shallow monitoring wells shall trigger additional parallel monitoring in adjacent deep aquifer wells.
2. Groundwater Sampling Schedule: Since an adequate database for groundwater monitoring of potential pollutants such as nutrients and pesticides does not exist for this site, monthly monitoring from May through October (six months), is required.
3. Groundwater Chemical Analyses: The dissolved chemical constituents shall be determined on samples passed through a 0.45 micron or smaller pore size filter (not made of cellulose nitrate). Instead, dissolved Total Kjeldahl Nitrogen (TKN, composed of organic N plus ammonium) will be assessed to capture organic forms of fertilizer now commonly used, and often

more mobile in percolating groundwater, such as urea-based and formaldehyde-based chemical fertilizers, as well as ammonium-based fertilizer. Additionally, dissolved total phosphorus (TP) will be assessed (composed of dissolved orthophosphate, polyphosphates, and organic phosphate forms).

4. Groundwater Sampling Methodology: Sampling of the groundwater monitoring wells shall be conducted pursuant to the schedule and frequencies shown in the table below, contained in the General Provisions for Monitoring and Reporting (Attachment 2), and according to provisions of the CHAMP.

All groundwater samples shall be grab samples and shall be drawn and analyzed according to the following:

Parameter	Units	Frequency
Static Water level	Ft above mean sea level	Monthly (March – Nov)
Direction of groundwater flow	Description or map	Monthly (March – Nov)
Dissolved Total Kjeldahl Nitrogen	mg/L as N	Monthly (March – Nov)
Dissolved Nitrate plus Nitrite Nitrogen	mg/L as N	Monthly (March – Nov)
Dissolved Total Phosphorus	mg/L as P	Monthly (March – Nov)
Dissolved Ortho Phosphorus	mg/L as P	Monthly (March – Nov)
Constituents of Pesticides (if used) depending on type used	ug/L	March, May, Sept., and November

E. Surface Water Monitoring

1. Goals of the Surface Water Sampling Program: The purpose of the surface water monitoring program is to assess impacts of applied chemicals on transport of these compounds into surface water.
2. Surface Water Sampling Schedule and Locations: Since an adequate database for surface monitoring of potential pollutants such as nutrients and pesticides does not exist for this site for the active golf season, monthly monitoring is required, May through October (six months) so long as surface water is present.

Three locations shall be sampled: Station R-9 - Squaw Creek at western boundary of Resort at Squaw Creek; Station R-5 - Squaw Creek at Squaw Valley Road; and Station R-10- Outflow from pond "A".

3. Surface Water Chemical Analyses: Chemical constituents to be measured are listed below (same as for groundwater).

All surface water samples shall be grab samples and shall be drawn and analyzed according to the following:

Parameter	Units	Frequency
Dissolved Total Kjeldahl Nitrogen	mg/L as N	Monthly (May – Oct.)
Dissolved Nitrate plus Nitrite Nitrogen	mg/L as N	Monthly (May – Oct.)
Dissolved Total Phosphorus	mg/L as P	Monthly (May – Oct.)
Dissolved OrthoPhosphorus	mg/L as P	Monthly (May – Oct.)
Total Suspended Solids (TSS)	mg/L	Monthly (May – Oct.)
Oil and Grease	mg/L	Monthly (May – Oct.)
Constituents of Pesticides (if used) depending on type used	ug/L	Monthly (May – Oct.)

Sampling and analysis shall be done in accordance with the General Provisions for Monitoring and Reporting (Attachment 2).

F. Turf (Soil) and Carbon Filter Samples

Samples are to be taken from the following sources at the following locations:

Three greens carbon filter samples--green No. 1, green No.7, and green No. 14;

Nine turf (soil) samples--green No.1, green No.7, green No. 14, tee No.1, tee No.7, tee No. 14, fairway No.1, fairway No.7, and fairway No. 14.

Carbon Filter and Turf samples are to be analyzed according to the following schedule:

Parameter	Units	Frequency
Dissolved Total Kjeldahl Nitrogen	mg/L as N	Annual (June)
Dissolved Nitrate plus Nitrite Nitrogen	mg/L as N	Annual (June)
Dissolved Total Phosphorus	mg/L as P	Annual (June)
Dissolved OrthoPhosphorus	mg/L as P	Annual (June)
Total Organic Carbon (TOC)	mg/L	Annual (June)
Herbicides and Fungicides (if used)	ug/L	3 months (April, May, June)

G. Analytical Capabilities

Reporting Limits Because of the unique and often pristine nature of waters in the Lahontan Region in general, exceptional analytical capabilities for nutrients and contaminants are required to assure compliance with Lahontan Basin Plan Water Quality and Non-Degradation Objectives. Required analytical reporting limits are:

Method	Reporting Limit (RL) ¹ mg/L
Total Dissolved Solids (TDS)	85
Chloride	3.0
Sulfate	25.0
Total Nitrogen (TN as N)	0.18
Total Kjeldahl Nitrogen (TKN)	0.13
Nitrate plus Nitrite as N	0.05
Total Phosphorus (TP as P)	0.02
Total Iron	0.13
Grease and Oil, EPA 1644, no silica gel cleanup, or equivalent	2.0

1 Reporting Limits shall be at a minimum as sensitive as the more restrictive of those required for analysis of pollutants (40CFR136), or analysis of drinking water specified by the California Code of Regulations, Title 22, Division 4, Chapter 15; or 40 Code of Federal Regulations, Part 141.

II. REPORTING

The above data including sampling results and inspections shall be submitted to the Board in accordance with the schedule described below (i.e. July 15, November 15). The Discharger shall arrange and compile data in a concise form for quick review by Regional Board staff.

<u>Report</u>	<u>Frequency</u>	<u>Report Submittal Dates</u>
Water Quality Monitoring	Semiannual	July 15, November 15
Parking Lot Monitoring ¹	Semiannual	July 15, November 15
Erosion Control Monitoring ¹ of Ski Area	Semiannual	July 15, November 15
Golf Course monitoring	Semiannual	July 15, November 15
Snow Conditioning Monitoring	Annual	July 15
Snowmaking Enhancement Chemicals Monitoring	Annual	July 15
Bioassessment Monitoring	Every Two Yrs	Jan. 15 (of even years)

1 Summary of monthly inspections, problems identified, and corrective measures taken.

Beginning on **July 15, 2009**, and each July 15 thereafter, monitoring reports shall be submitted to the Board for the period of sample collection covering the previous May and June. Beginning on **November 15, 2009**, and each November 15 thereafter, monitoring reports shall be submitted to the Board for the period of sample collection covering the previous July, August, September, and October. Beginning January 15, 2010, and every two years thereafter, bioassessment reports shall be submitted. Additionally, any significant increase in chemical constituents detected during monthly monitoring must be reported immediately on receipt of the laboratory report to Board staff electronically or by FAX.

Ordered by: _____ Dated: _____
HAROLD J. SINGER
EXECUTIVE OFFICER

- Attachments:
1. Resort at Squaw Creek Golf Course Chemical Application Management Plan, Version Approved on 5-2-89 with Approved Changes Through 5-12-06.
 2. General Provisions for Monitoring and Reporting. September 1, 1994
 3. Sampling and Analysis Requirements Numeric Target Monitoring, Squaw Creek Total Maximum Daily Load for Sediment, Placer County

ATTACHMENT 1

ELECTRONIC COPY OF VERSION APPROVED ON 5-2-89 WITH APPROVED CHANGES THROUGH 5-12-06

**GOLF COURSE
CHEMICAL APPLICATION MANAGEMENT PLAN**

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- III. Preliminary Geologic and Geotechnical Investigation, Squaw Creek Development, Squaw Valley, California, Kleinfelder, 6/20/84
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VOLUME I

CHAPTER 1

1.0 INTRODUCTION

1.1 Purpose

This Chemical Application Management Plan ("CHAMP") has been prepared for the operation and maintenance of the 18-hole, links-style golf course (the "project") being constructed in connection with the Resort at Squaw Creek (the "Resort project") being undertaken by the Perini Land & Development Company ("Perini") in Squaw Valley, Placer County, California.

The purpose of the CHAMP is to provide technical public disclosure regarding the proposed fertilizers and chemicals to be used on the golf course, the methods of application, limitations on use, and known information regarding the potential health hazards of those chemicals. Additionally, this CHAMP, when reviewed by the Technical Review Committee (TRC), and approved and accepted by Placer County and the Lahontan Regional Water Quality Control Board, will provide the basis for the use of fertilizers and chemicals in connection with the operation of the golf course component of the Resort at Squaw Creek. Further, it sets forth the detailed procedures applicable to the use of fertilizers and chemicals which are to be adhered to by maintenance personnel in connection with the operation of the golf course. To facilitate this, Chapter 5 has been designed to be used as a manual by maintenance personnel and therefore presents information also found in Chapters 1 through 4.

1.2 Requirements

The legal requirements for the preparation and content of this CHAMP, as well as its review and approval, are set forth in the project approval conditions previously established by the County of Placer and the Regional Water Quality Control Board--Lahontan Region for the Resort project, as further supplemented in the written agreements which resolved two separate lawsuits applicable to the Resort project.

On April 16, 1985, the Board of Supervisors of the County of Placer issued the final approvals for the Resort project to proceed. Those approvals were based upon certain required Conditions of Approval, including Condition No. 120, which reads as follows:

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- “120. There shall be no application of chemicals on or near the golf course without written permission from the Division of Environmental Health. Such permission shall only be granted, if at all, if it is first found the chemical(s) to be used and method of application are in full compliance with the Golf Course Chemical Application Management Plan required hereby to be submitted and approved by the Division of Environmental Health (after consultation with applicable public agencies), which Plan shall also be submitted to the Board of Supervisors for its approval and incorporation in a legally-binding contract with the applicant.”

A full copy of the most current Placer County Conditions of Approval is provided in Addendum I.

Following approval by the Board of Supervisors, the approval was challenged in a lawsuit filed in the Placer County Superior Court by Roger W. Pierucci, on behalf of himself and seven other plaintiffs. That lawsuit was settled by a Stipulated Order executed by the Placer County Superior Court on August 1, 1985. The settlement required, among other things, that the County of Placer “shall require and ensure that the... Golf Course Chemical Application Management Plan required by [the Conditions of Approval] include and set forth those provisions that are specified at length in the document entitled “Memorandum Regarding Content and Implementation of Domestic Water Quality Control Plan, Water Quality Monitoring Program, and Golf Course Chemical Application Management Plan concerning the Resort at Squaw Creek” (hereafter the “Settlement Memorandum”), a copy of the Memorandum was attached to the Court Order. That Settlement Memorandum set forth various requirements regarding the Water Quality Monitoring Program that was required to be implemented. Based on the results of that Water Quality Monitoring Program, and other information developed, the Settlement Memorandum then set forth detailed provisions regarding the purpose and content of the proposed Golf Course Chemical Application Management Plan.

The technical work giving rise to this CHAMP has been done under the guidance and review of the TRC--a technical review panel of highly respected and knowledgeable scientists and engineers formed in 1985 pursuant to the terms of the Placer County Condition of Approval and Pierucci Settlement Memorandum.

In general, the Settlement Memorandum provided that this CHAMP should be prepared by Perini using qualified consultants, and then shall be submitted to the Placer County Division of Environmental Health (PCDEH) for review, with copies to the Squaw Valley Technical Review Committee (TRC) for it to undertake its own independent review and make

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recommendations. The CHAMP, once approved by the PCDEH, will then be set forth and incorporated in a legally binding written contract to be entered into between Perini and Placer County acting through the Board of Supervisors.

The CHAMP was intended to address the following issues:

- a) Specific chemicals and fertilizers selected for use on the project must be identified and accompanied by detailed explanations of the reason for their selection and their proposed use. Further, a summary of all potential health impacts of each chemical to humans and wildlife is to be included.
- b) The manner and means of application of each chemical and fertilizer must be specified, including a statement of the controls or restrictions to be imposed on their use.
- c) A list is to be compiled of those commercially available chemicals and fertilizers that are absolutely prohibited from use within Squaw Valley, due to potential risks to public health or safety. Included in this list are all insecticides, rodenticides, algicides, etc., and any chemicals known to be carcinogenic to humans or wildlife, or identified by California agencies to be ground water contaminants.
- d) Contingency procedures are to be set forth to provide for immediate correction of any improper or excessive use of chemicals, or any contamination of the water supply found to be caused from such chemicals.
- e) To the extent possible, any known information regarding additive or synergistic effects from the combination of any or all of the chemicals being used should be revealed.

The Settlement Memorandum goes on at length to set forth the required specific content and scope of the CHAMP. A full copy of the applicable provisions of the Pierucci Settlement Memorandum are found in Addendum I of Volume III.

Following the resolution of the Pierucci lawsuit, Perini then applied for Waste Discharge Requirements from the Lahontan Regional Water Quality Control Board. On September 12, 1985, the Lahontan Board issued Waste Discharge Requirements for all of the Resort project except the golf course component. Subsequently, after processing amendments to its North Lahontan Basin Water Quality Plan allowing Lahontan to review the golf course component, a new lawsuit was filed by the Institute of Conservation Education, the Sierra Club, Frederic D. Sylvester and Edward H. Heneveld, against the State Water Resources Control Board, effectively seeking to prevent Perini from obtaining the requisite approvals for construction of the golf course. That lawsuit was in turn settled by a new Settlement Agreement dated

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April 29, 1986, in which the parties agreed to recommend to the Lahontan Board the inclusion of certain additional requirements applicable to the CHAMP.

As a result, amendments to the Waste Discharge Requirements for the project were approved by the Lahontan Board on May 3, 1986 to include a number of revisions to be incorporated in the CHAMP. Additionally, those Waste Discharge Requirements set forth specific requirements for water quality protection for the project. Those Waste Discharge Requirements were further amended on September 10, 1987 to incorporate some additional provisions resulting from the Corps of Engineers' approval of the project.

Those final Waste Discharge Requirements (Lahontan Board Order No. 6-87-102) also provide for the development of this CHAMP. Additionally, the Waste Discharge Requirements set forth a number of detailed provisions regarding use of fertilizers, herbicides, fungicides, and other chemicals. Further, the Waste Discharge Requirements provide for the development of a "test green" as part of the process giving rise to the CHAMP (Addendum X), as well as a monitoring program. A full copy of the current Waste Discharge Requirements are found in Addendum I of Volume III.

In summary, the requirements for the development of this CHAMP was first set forth in Condition No. 120 of the Placer County Board of Supervisors' Conditions of Approval. That concept was further expanded by the terms of the Pierucci Settlement, as well as the detailed provisions of the Lahontan Waste Discharge Requirements, which provision resulted in part from the 1986 settlement of the separate lawsuit filed by the Sierra Club, the Institute for Conservation Education, Frederic D. Sylvester, and Edward H. Heneveld.

1.3 Development of the CHAMP

This CHAMP represents the culmination of over four years of intensive study, field testing and analysis undertaken by a multi-disciplinary team under the direction of KLEINFELDER. KLEINFELDER was retained by Perini in 1984 to lead this effort, and during the last four years has spent over 10,000 man hours developing data and background information to allow preparation of this CHAMP.

The many requirements and provisions placed on the CHAMP gave rise to a number of intermediate steps. These intermediate steps are the foundation on which this volume is based, and have included the following studies and interim reports.

- 1) Preparation and certification of a final Environmental Impact Report (EIR) for the Resort Project. A copy of the EIR is presented as Addendum II of Volume III.
- 2) A preliminary geologic and geotechnical study of the general site. The results of the study are presented as Addendum III of Volume III.

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- 3) An evaluation of the near surface hydrogeologic environment of the site. The results of this study are presented as Addendum IV of Volume III.
- 4) A test green work plan approved by the TRC. This work plan is presented as Addendum V of Volume III.
- 5) A ground water and surface water monitoring work plan reviewed and commented on by the TRC. This work plan is presented as Addendum VI of Volume III.
- 6) Supplemental information with regard to formulating the project's waste discharge requirements. This information is presented as Addendum VII of Volume III.
- 7) A soil resource inventory of the meadow portion of the project. The results of this inventory are presented as Addendum VIII of Volume III.
- 8) Implementation of the Squaw Valley basin wide monitoring program which included 33 ground water monitoring wells and five surface water monitoring stations. Each monitoring point was sampled numerous times during the past two and one half years to compile an extensive background data base. The results of this study are provided as Addendum IX of Volume III.
- 9) The construction and operation of a test green to simulate actual field conditions and monitor the fate of applied fertilizers, herbicides, and fungicide products. The test green was constructed in the fall of 1985 and monitored through 1988. The test green project incorporated over 55 pressure-vacuum lysimeters and three ground water monitoring wells, one of which was equipped with a continuous ground water level monitoring device. Results of the test green are presented in Addendum X of Volume III.
- 10) A review of all literature available on the toxicology and environmental fate of each proposed chemical and fertilizer. The review also identifies data gaps, and recommends only those chemicals that will not contaminate surface or ground water, and that will not produce a hazard to humans or wildlife. The results of this review are presented in Volume II, Toxicological Evaluation.

The multi-disciplinary technical team formed by KLEINFELDER to undertake the intensive investigation and analysis work leading to preparation of this CHAMP has included:

Consultants:

Mrs. Diane Anderson, Organic Chemist
Dr. James Butler, Turf Specialist
Dr. James L. Byard, Toxicologist
Mr. Jim Heidker, Inorganic Chemist
Dr. Roger Jacobson, Hydrogeologist
Dr. Glenn Miller, Chemist
Dr. Roman Pyrih, Geochemist
Mr. John Stanowski, Golf Course Superintendent
Mr. William Elliot, Solute Transport Modeler

Laboratories:

Agricultural and Priority Pollutants Laboratory (APPL), Fresno, California
California Analytical Laboratories, Sacramento, California
Canonie Engineers, Inc., Stockton, California
CHEMAX Laboratories, Inc., Reno, Nevada
Clinical Lab of San Bernardino, San Bernardino, California
Desert Research Institute (DRI), Reno, Nevada
Great Basin Laboratories, Inc., Reno, Nevada
McKesson Environmental Services, Pleasanton, California

The TRC has met regularly since it was formed to review and comment upon the direction of technical work and data being developed by KLEINFELDER. In addition, they are responsible for reviewing and making recommendations in regards to this CHAMP. Members of the TRC include:

Mr. James Scribner of Placer County Division of Environmental Health - Chairman.

Mr. Ray Davis of KLEINFELDER representing Perini.

Dr. Ranjit Gill of Lahontan RWQCB.

Mr. Roger Pierucci representing the parties to the Pierucci Lawsuit, assisted by Dr. Robert Coates.

Dr. Alvin Greenberg of Risk Science Associates representing the Sierra Club, Institute for Conservation Education, and the two named plaintiffs.

Mr. Fred Fahlen of Dewante and Stowell, Consulting Engineers representing Squaw Valley County Water District and the Squaw Valley Mutual Water Company.

1.4 The Golf Course Project

The golf course components of the Resort at Squaw Creek have been designed and sited, during the environmental and regulatory review process, to achieve the best balance between environmental, land use, and operational requirements. Over 25 separate golf course plans were reviewed and considered before the final approved configuration was ultimately selected through the regulatory review process.

The golf course design is in the "links-style" to preserve as much natural buffer area as possible, while providing a visually attractive and, from a golfer's standpoint, challenging golfing experience. As a result of the links-style design, a total fertilized playing area has been reduced to approximately 48 acres from the usual 140 to 150 acres involved in the construction of the typical "municipal style" 18-hole golf course. The total non-fertilized playing area will be approximately 70 acres.

In addition, the golf course design includes several innovative state-of-the-art leachate control devices and filtering systems. A leachate collection and activated carbon filtering system will treat seepage and runoff waters collected from golf greens prior to discharge. Play area drainage design has incorporated flow paths away from ponds and perennial streams. Greens surfaces will be elevated above the annual high ground water levels to minimize underdrain flooding. Furthermore, when appropriate, the greens may utilize artificial "ice blanket" covers to inhibit the growth of destructive snow molds. An ongoing surface and ground water monitoring program has been approved by the Lahontan Regional Water Quality Control Board to check for water quality impacts from the project.

The analysis and recommendations contained in this CHAMP recognize the unique and special qualities of the Squaw Valley areas and the need to undertake unique and rigorous measures to protect the water quality of that area. The design of the golf course has been developed to best meet the environmental constraints of the area. This CHAMP has been developed to limit the chemicals and fertilizers to be used and their means of application, and to provide protection of both the surface and ground water quality of the area. Thus, the maintenance products selected for use, the mode of application, and leachate migration control measures set forth in this CHAMP have received a rigorous review in both design criteria and implementation specifications. The selected maintenance products have been chosen because of their preferred environmental degradation properties and their low toxicological risk.

1.5 Content of CHAMP

The CHAMP contains four volumes which, together, constitute a comprehensive summary of the agreements, research, and evaluations conducted for the Resort at Squaw Creek golf course.

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These volumes are organized as follows:

- Volume I: Volume I contains the actual chemical use application plan which will be used during the design, construction, and operation of the golf course. In addition, a summary of all legal settlements and technical data are included (Chapters 1.0 and 2.0, respectively). Chapter 5.0 is designed to stand alone as a Project Operations Manual for maintenance personnel.
- Volume II: Volume II contains a toxicological evaluation of the selected maintenance herbicides, fungicides, and fertilizers for the project. It provides an extensive summary of all research articles pertaining to the toxicity and environmental fate of these chemicals as well as identification of data gaps.
- Volume III: Volume III is a series of addenda containing complete summaries of all pertinent project agreements, approvals, reports, evaluations, and proposals.
- Volume IV: Volume IV contains all analytical test results, and will be provided upon request only.

CHAPTER 2

2.0 SUMMARY OF TECHNICAL DATA

2.1 General

Several investigation reports and field test programs have been conducted for Perini to identify the natural character of Squaw Valley. The following reports have been submitted to describe the physical aspects of the project.

- Final Environmental Impact Report for the Resort at Squaw Creek, Placer County, California, prepared by ECO-ANALYSTS, Chico, California, October 4, 1984 (Volume III, Addendum II)
- Preliminary Geologic and Geotechnical Investigation, Squaw Creek Development, prepared by KLEINFELDER, Reno, Nevada, June 20, 1984 (Volume III, Addendum III)
- Excavation and Near Surface Hydrogeologic Evaluation for Proposed Golf Course at Squaw Creek Development, Squaw Valley, California, July 3, 1984 (Volume III, Addendum IV)
- Ground Water and Surface Water Monitoring Program, Prototype Golf Course Test Section, Resort at Squaw Creek, prepared by KLEINFELDER, August 28, 1985 (Volume III, Addendum V)
- Proposed Surface and Ground Water Monitoring Program, Resort at Squaw Creek, prepared by KLEINFELDER, October 25, 1985 (Volume III, Addendum VI)
- Supplemental Information Waste Discharge Report Information, Resort at Squaw Creek, prepared by KLEINFELDER, February 7, 1986 (Volume III, Addendum VII)
- Soils Resources Inventory of the Proposed Golf Course at the Resort at Square Creek, prepared by KLEINFELDER, Reno, Nevada, August 26, 1986 (Volume III, Addendum VIII)

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- Basin Water Quality Investigation, Resort at Squaw Creek, March 30, 1987
(Volume III, Addendum IX)
- Results of Test Green Operations, Resort at Squaw Creek, June 29, 1988
(Volume III, Addendum X)

The information in this section is an updated summary of the physical characteristics that have been described through the various investigations. Continued sampling and monitoring conducted since the preparation of the early reports has modified some of the assumptions and findings listed in the original report submittals.

2.2 Results of Basin Wide Monitoring Program

An extensive monitoring well network was constructed at the site after the proposed plan was reviewed and modified by the TRC. This network of monitoring wells goes far beyond that required by regulatory agencies for projects of this size and nature. Some 33 monitoring wells have been installed in an array of well pairs which spans the valley. The paired wells are completed at different depths to evaluate both shallow and deep ground water aquifer units. A secondary network of wells extends longitudinally along the axis of the basin, a short distance south of Squaw Creek. The secondary set of wells will allow for more accurate tracking of individual constituents, and will also allow identification of constituents moving from the developed area of the project toward Squaw Creek.

Squaw Valley is an eight square mile (5,100) acre watershed in the Truckee River basin located between Lake Tahoe and Truckee, California. Present uses of the valley include approximately 800 residential units, an Olympic class ski area, and limited commercial development. Water supplies are drawn exclusively from within the watershed, nearly entirely from wells at the western end of the valley floor. The principal source of water for the valley is an aquifer of unconsolidated glacial and post glacial sediments beneath the 400 acre valley floor. The estimated average thickness of the aquifer is about 80 feet. Previous geophysical studies in the valley suggest that the maximum depth to bedrock varies from about 120 to 180 feet along the longitudinal axis of the basin. (Gasch & Associates, 1973).

Based on an evaluation of the appended data we are providing the following descriptions of the project site:

- Squaw Valley was primarily formed by alpine glaciation, and filled with unconsolidated sediments during glacial recession. The stratigraphy of the sediments deposited in the valley include a lower section of moraine deposits, a middle section of glacial-lake sediments, deltaic and stream deposits and an upper section of sediments reworked by modern Squaw Creek.

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- Two distinct aquifer systems were identified in the eastern two-thirds of the valley (see Addendum IX of Volume III). Static water levels in the upper and deeper portions of the basin aquifer may differ up to 3 feet during the late summer, when water levels are commonly most stable. Elsewhere, the aquifer system is more complex with only partial hydraulic connection throughout the upper 60 feet of saturated basin fill.
- Squaw Creek derives most of its flow from overland flow of precipitation and snowmelt runoff. There is evidence to suggest that ground water from dilute hydrothermal fluids is one of several sources of deeper ground water beneath the central and western portion of the study area. This hydrogeothermal influence is most noticeable during dry periods, primarily as increased concentrations of dissolved solids, most notably sulfate, bicarbonate, calcium and, to a lesser extent arsenic.
- Squaw Creek is predominantly a gaining stream in the meadow reach. Net inflow is typically in the range of 0.5 to 1.0 cubic feet per second (cfs) during the early- and mid-summer months; greater accretion is observed in winter and lower values late in summer. Mean net inflow for Water Year 1986 averaged about 4.7 cfs in the meadow reach; for comparison, mean streamflow during Water Year 1986 was 36.3 cfs for the watershed as gaged at the Squaw Valley Road. During the drier Water Year 1987, streamflow gains within the meadow reach averaged 1.3 cfs, and basinwide runoff was 11.5 cfs. Runoff in the adjoining Ward Creek watershed during these two years was 130 and 37.5 percent, respectively, of the mean for the 17 year period of record.
- Relative to other streams in the area, Squaw Creek currently appears to be transporting an unusually large sediment load, commonly several times that conveyed at a given flow by other streams in the region. As with many streams of comparable size in the area, the proportion of habitat-impairing sand-sized material is high; the bedload fraction--medium to coarse sands and gravels--constituted 70 to 75 percent of the total sediment yield during the two years of study. Disturbance of banks by the four major flood crests in 1982, record snowmelt in 1983, and two high-recurrence floods in 1986, may be contributing to the high loads observed; historic realignment of Squaw Creek in the western portion of the valley may also be contributing, as may other sources related to land use. The background conditions observed in 1985, 1986, and 1987 may not be representative of those typically affecting sediment movement and bed sedimentation in Squaw Creek. Observer accounts and file notes by Department of Fish and Game biologists over the years indicate that at least some degree of bed sedimentation may be chronic throughout the meadow reach.

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- The water in the deeper aquifer is highly variable in chemical quality. The water type from the deeper wells varies between calcium bicarbonate and calcium sulfate. In two subareas, it is believed that deeply circulated, upwelling water has contributed significant amounts of dissolved solids to the aquifer system. The upwelling water is believed to be a calcium sulfate type, with subordinate bicarbonate, similar to hydrothermal vents of hot springs in Sierra Valley and elsewhere along eastern Sierran fracture zones.
- Water samples from the deeper aquifer in several locations exceeded the EPA primary drinking water standard for arsenic and the secondary standards for sulfate and total dissolved solids. In general, these areas are located in the north central side of the valley between the Squaw Valley Stables and Russell Road. Although these values have at times exceeded the drinking water standards, they are more indicative of poor quality water rather than non-potable, poisonous water. This water, if encountered, should be pretreated prior to human consumption.
- The shallow aquifer is generally located within 10 to 15 feet of the ground surface. The upper aquifer contains water of relatively good quality. The shallow aquifer is primarily recharged from infiltration of precipitation and snowmelt, and discharges to Squaw Creek. Some seasonal variation in general mineral quality of the shallow aquifer should be expected. The shallow ground water is generally of a calcium sulfate-calcium bicarbonate transitional type. A few areas within the near-surface aquifer have elevated calcium sulfate water presumably due to contributions from upwelling waters from the deeper aquifer. This upwelling water appears to have resulted in poor quality water in the shallow aquifer in the area southeast of the Squaw Valley Stables and south of Russell Road.
- No detectable quantities of synthetic organic pesticides were confirmed during repeated sampling of surface and ground water at the site. Although unlikely, the impact on the ground water from the misuse of fungicides and herbicides on the golf course will be evident by scheduled sampling. However, further investigations would be necessary to assess the source area(s) and level of impact.
- The results of stream sampling indicate the nutrient and inorganic constituents of Squaw Creek at a given stream flow can vary by two orders of magnitude depending on the season. The identification of background wells in unaffected areas of the meadow will be critical in recognizing impacts from the

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- development after buildout. Based on the final configuration of the golf course, we recommend Monitoring Wells 303, 309, 310, 330, 331, and 332 be used for this purpose.
- Concentrations of most constituents in Squaw Creek and its tributaries vary substantially with the amount of streamflow. Water quality also shows distinct seasonal patterns for the summer/fall and winter seasons. Present concentrations of nitrate, sulfate, nitrogen, and total filtrable residue frequently exceed water quality objectives, as stated in the Lahontan Board's Waste-Discharge Requirements 6-86-52 (Revised to 6-87-102) for Squaw Creek, prior to construction of the proposed project. Pre-project annual mean concentrations for constituents listed in the receiving water limitations provided by Lahontan RWQCB for Squaw Creek are exceeded by the statistical mean of data collected to date.
- Hydraulic analysis of the study area indicates ground water velocities can range from between 0.1 and 0.4 feet per day in the shallow aquifer. The deeper aquifer in the eastern portion of the valley is undeveloped; flow gradients are assumed to be low in this unit and velocities are undetermined.
- Review of aquifer test data from the community well field location in the western portion of the valley indicates that it is unlikely under current pumping conditions that water will be induced to flow upgradient from the area of the golf course subject to fertilization and herbicide/fungicide application to the municipal/county well field.
- Ground water was sampled from three selected shallow wells and analyzed using EPA Methods 624 and 625 for synthetic organic chemicals. All values of contaminants reported in these analyses were nondetectable except for Well 331 which had a confirmed level of 10 parts per billion trichloroethane (TCA) in October, 1986. This value does not exceed the California safe drinking water standard for this compound and the TCA was not detected in water samples collected six months later in March, 1987. A letter addressing this issue was submitted by Dr. James Byard to comment on the significance of this finding. Dr. Byard's letter of December 14, 1986 reads as follows:

"The purpose of this letter is to briefly review the occurrence, environmental fate, and toxicity of TCA (1,1,1-trichloroethane or methylchloroform). TCA is a chlorinated hydrocarbon solvent that has been widely used since the mid 1950s as a cold bucket degreasing solvent. This highly volatile solvent is barely but significantly soluble in water and

is chemically stable. Because of these properties, TCA is highly mobile and relatively persistent in the environment.

Waste solvent poured on the ground or dumped "down the drain" tends to volatilize into the air or seep into soil. Material in the air is slowly photodegraded to inorganic substances. TCA in soil is leached to ground water, where it can diffuse outward, migrate with the ground water, and slowly breakdown with a half-life of approximately six months. For these reasons, TCA is commonly encountered in ground water at sites of use.

The recent findings of 10 ppb TCA in Squaw Valley should be neither surprising or alarming. Degreasing solvents are widely used for cleaning metal parts and septic systems, both of which are found in Squaw Valley. Spillage of only a small volume of TCA (perhaps only a quart) could account for 10 ppb in the shallow ground water in the one well that tested positive. The value is one twentieth of a conservative action level and therefore does not pose a health concern."

A complete discussion of the baseline water quality results is provided in the Basin Water Quality Investigation Report provided in Addendum IX of Volume III.

2.3 Results of Test Green Operations

2.3.1 Introduction

The Test Green Operations report presents the results of a two and one half year study to evaluate the use of fertilizers, herbicides, and fungicides during the operation of the proposed golf course associated with the Resort at Squaw Creek. Originating in the fall of 1985, this study was integrated with a concurrent baseline water quality investigation of the entire Squaw Valley.

The study consisted of accomplishing the following tasks:

- Toxicological evaluation of the potential list of chemicals allowed for application in Placer County by current county regulations.
- Leach column testing in the laboratory to allow theoretical computation of the leachability and mobility of the various candidate herbicides and fungicides identified.

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- Design, construction and subsequent operation of a demonstration green to empirically test the expected results, based on previous observations in the Tahoe-Truckee region and reports from elsewhere in the country.
- Compilation of the physical and analytical data from the demonstration green, monitoring systems and evaluation of the results with respect to the laboratory column testing, field control and chemical application rates.

During early development of project approvals a 'Technical Review Committee' (TRC) was formed to oversee the testing and design process. The work accomplished during the investigation phase of this study was accomplished with the regular review and guidance of the TRC.

The preliminary phases of the site evaluation plan commenced in February of 1984. Initial toxicological evaluation of the potential herbicide/fungicide candidates began in September, 1985. The demonstration green was constructed in October and November of 1985. Soil column testing was conducted in April and August of 1986. The application of fertilizer and fungicides/herbicides commenced in June and December of 1986, respectively.

2.3.2 Study Objectives

The test green study had the following objectives:

- Identify the most efficacious, immobile, least toxic and least persistent agents available for use on the intended golf course, consistent with suitable results.
- Assess the effects of maximum application rates of the fertilizer and selected fungicide and herbicide agents in the project setting.
- Provide golf course engineering criteria, based on the prototype testing, which will enable the project to meet the waste discharge requirements.

2.3.3 Conclusions

Based on an evaluation of the data acquired during the investigation, we have developed the following conclusions:

- The potential for Fungicide II (chloroneb) and Weed-B-Gon (2,4-D and MCPP), to affect the ground water underlying the proposed golf course is low provided the chemicals are properly applied and the recommendations presented in this document are followed. The basis for this conclusion is the

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limited mobility of the active ingredients of the two products as observed in both the laboratory column testing and empirical testing on the test green, coupled with their relatively short half-lives*.

- Application of nitrates, herbicides, or fungicides in amounts greater than those stated in Chapter 4 of this volume has the potential to affect the ground water. Fungicides and herbicides will be used only as a last resort if other methods are ineffective.
- Based on two years of data, the mean annual flux of total nitrogen to the ground water, based on an application rate of 66 percent of bag strength (0.50 lbs. of N/1000 ft²), is estimated at about 0.50 ppm over background values.
- The final golf course design should incorporate green surface runoff collection devices to eliminate the potential for surface sheet flow to impact surface water quality. In addition, all collection sumps should be designed to collect subdrainage from the golf greens. If Fungicide II (chloroneb) is used on green surfaces, all surface water runoff and leachate from the green should be directed to an activated carbon treatment unit. Impacts on surface water quality from the application of Weed-B-Gon on fairway areas can be mitigated by proper scheduling and the use of post application mitigation measures.
- Special concern should be given to designing an efficient irrigation system that will minimize the impact of wind, avoid over-watering and uniformly distribute the desired rate of application.
- Previous KLEINFELDER reports have indicated the velocity of ground water in the vicinity of the test green is about 0.3 ft./day. The nearest ground water monitoring well is located about 25 feet from the test green. It appears the test green was operated for a sufficient length of time for the applied compounds to have intercepted the nearest monitoring well. Our ground water testing indicates none of the monitoring wells surrounding the test green had measurable changes in the constituents of concern.

*Half-life of chloroneb: in soil, 2-5 weeks; in grass, 7-23 days; a few inches below soil surface, 3-6 months; in air, volatilized and immobile in soils. Half-life of 2,4-D: in soil, 3-7 days; in water, approximately 7 days. Half-life of MCP: in soil, 11-18 days; in anaerobic conditions, complete degradation in approximately 35 days. All values from Volume II, Toxicological Evaluation and associated appendices. Values may vary between authors and their experimental designs.

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- In the event Fungicide II (chloroneb) is used and observed below a depth of 1 foot below the ground surface, the application of Fungicide II will cease until the natural decay process has reduced the compound to a non-detectable level.

CHAPTER 3

3.0 RECOMMENDED GOLF COURSE DESIGN CRITERIA

3.1 Introduction

The purpose of this section is to present engineering criteria that will enable the proposed golf course to function as intended, minimizing the potential for the course to impact the surface or ground water of Squaw Valley.

More specifically, the golf course engineering criteria described herein are intended to mitigate the impacts from the application of fertilizer, fungicide and herbicide products that may be required during the ongoing maintenance of the golf course. The recommendation presented in this section are based on an evaluation of the technical data reviewed in Chapters 1 and 2 of this volume.

3.2 General Design Criteria

3.2.1 A minimum of 10 feet of rough shall surround the perimeter of all fertilized playing areas. The rough will not be fertilized or treated with herbicides or fungicides. The rough area will act as a buffer zone to prevent the fertilization of an area located directly adjacent to a seasonal wetland, perennial water course or surface water body. The location of wetland buffer zones is also recognized as a preferred practice for water-quality protection surrounding areas where maintenance chemicals and fertilizers are used.

3.2.2 The existing network of monitoring wells shall be retained and integrated into the design of the golf course. The golf course construction contractor shall take all steps necessary to preserve the structural integrity of the monitoring wells located on the project site. Any monitoring well that falls in an area of play must be protected or adapted to both allow play and protect the integrity of the well.

3.2.3 In compliance with the Lahontan Board Order No. 6-87-102, temporary storage of approved fungicide(s) and herbicide(s) shall not exceed 30 days. To facilitate the temporary storage, a chemical holding area shall be designated at the site for the purpose of storing fungicides and herbicides. The facility shall be located above the established level of the 100-year flood and secured to prevent entry by unauthorized personnel and to prevent misuse or theft of its contents. The facility shall conform with Group H Occupancies for Chapter 9, Division 7 of the Uniform Building Code (1988 Edition) and should be large enough to store materials collected from potential chemical spills or misuse (see Section 5.7 of this volume).

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3.2.4 There shall be a minimum vertical separation of 2 feet between any green playing surface and the expected maximum seasonal ground water elevation. This will reduce the potential for high ground water to inundate the underdrain collection systems and allow a sufficient thickness of unsaturated soil at attenuate infiltrating compounds.

3.2.5 No playing surface requiring fertilizer, fungicide or herbicide will be constructed within 25 feet of Squaw Creek or the open drainage channels on the project site as required by the Placer County Conditions of Approval No. 104.

3.2.6 Fungicide II (chloroneb) will only be used if future experience with operation of the golf course indicates its use will be required to prevent substantial damage of the playing surface. Section 3.4 requires the green playing surface and subdrains be designed to drain to a central collection point with the intent that an activated carbon treatment unit be installed in the event Fungicide II is used. Furthermore, the test green report indicates the project should be able to comply with the waste discharge requirements for the project, providing the golf course maintenance operations comply with the requirements found in this document. Based on this information, we are not requiring the use of liners beneath the green surfaces.

3.3 Irrigation

3.3.1 The irrigation system should be designed for high application efficiency and operated to minimize the infiltrating of applied water below the root zone depth, typically 12 inches below the finished ground surface. Short, frequent, nighttime irrigation cycles are preferred.

3.3.2 The irrigation systems shall maximize the even distribution of water to all irrigated areas. No area should exceed the maximum application rate by more than 15 percent. Irrigation of areas in the meadow, and landscaped areas adjacent to buildings and paved areas should be based on actual needs of vegetation. Water application shall be controlled as not to produce ponding, water-logging, or run-off, particularly after fertilizer applications (Placer County Conditions of Approval No. 111).

3.4 Drainage

3.4.1 All fertilized playing surface shall be graded to drain. No standing water will be allowed on any fertilized or treated playing surface.

3.4.2 Surface water runoff will be diverted away from sand trap areas.

3.4.3 Sand trap subdrains may discharge into natural vegetation areas.

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3.4.4 As specified in Robert Trent Jones golf course design, all greens construction will include an underdrain system to allow for the discharge of infiltrating irrigation, rainfall and snow melt. The green surface and subsurface drainage shall gravity feed to a central collection sump. There shall be a minimum vertical separation of 0.5 feet between the greens subdrain invert and the expected maximum seasonal ground water elevation.

3.4.5 All subdrains will be constructed with a minimum fall of 1 percent for perforated pipe and 0.5 percent for solid pipe.

3.4.6 If fungicides are applied, all surface and subsurface drainage from each treated green will require treatment before discharging to the surrounding land surface. The treatment will consist of passing the drainage through an activated carbon contact chamber sized to adequately treat a volume of liquid resulting from a 20 year, one hour storm event. The purpose of the activated carbon will be to chemically adsorb organic compounds that may be found in the discharge.

3.4.7 No fungicide or herbicide will be applied to green 17 at any time.

CHAPTER 4

4.0 BASIS OF MANAGEMENT PLAN

4.1 Introduction

This section addresses the proposed maintenance and operation procedures that involve the application of fertilizers, fungicides, herbicides and irrigation water at the project. The specific management requirements that have been developed for this project are underlined. Both the rationale behind each requirement and any additional detail information is presented in the subsequent paragraphs.

To help clarify some terms, the following definitions are given:

CHAMP - Chemical Application Management Plan. Its purpose is to provide technical public disclosure regarding the proposed fertilizers and chemicals to be used on the golf course, the methods of application, limitations on use, and known information regarding the potential health hazards of those chemicals.

Chloroneb - Chloroneb is a white, solid fungicide used to control gray snow mold during winter months. It is applied in the form of Fungicide II by Scotts as a solid adsorbed to ground corn cobs for even distribution. It is the only fungicide approved for use on the project.

Glvphosate - Glyphosate (as found in Roundup by Monsanto) is a herbicide used for spot eradication of weeds. It will only be used on maintained fairways and tees. It is applied as a dilute spray consisting of glyphosate, a detergent and water.

Golf Course Operator - The golf course superintendent or his appointed representative.

Mecoprop (MCPP) - One of two active ingredients found in Weed-B-Gon by Ortho. It is used to control broadleaf plants.

Pesticide - As used in this CHAMP, pesticide refers only to the herbicides and fungicides approved for use on the project.

Project - The 18-hole golf course being constructed in connection with the Resort at Squaw Creek in Squaw Valley.

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Spot Application - The area of application is not to exceed 5,000 square feet.

TRC - Technical Review Committee, a review panel formed pursuant to the terms of the Placer County Condition of Approval and the Pierucci Settlement Memorandum.

2,4-D - 2,4-D is one of two active ingredients found in Weed-B-Gon by Ortho. It is used to control broadleaf plants. It should be noted that any herbicide containing "2,4-D" will be voluntarily suspended from use for a period not exceeding 180 days from the date of approval of the CHAMP to allow the State of California a reasonable length of time to complete its review of Proposition 65 chemicals including 2,4-D.

4.2 General Management Requirements

4.2.1 The use of approved maintenance fertilizers and chemicals on the project shall comply with the guidelines presented in the CHAMP. The golf course superintendent shall assume full responsibility for compliance with the CHAMP.

The application of fertilizers must be closely regulated to comply with the provisions and discharge specifications set forth in the project legal requirements. The implementation of the CHAMP is intended to protect the water quality of Squaw Valley. Since the golf course superintendent will be responsible for the operation of the golf course, he will also be responsible for implementation of the CHAMP.

4.2.2 All maintenance operations shall be conducted under the supervision of person(s) possessing a current California Department of Food Agriculture (DFA) Qualified Applicator or Advisor License and/or Certification. Information concerning the qualifications of the Qualified Applicator are presented in Addendum XI.

California state law requires that only qualified persons handle, mix and dispense commercial agricultural chemicals. Misuse of the maintenance chemicals may impact the water quality in Squaw Valley.

4.2.3 All golf course maintenance personnel will read and follow Chapter 5.0 of Volume I of the CHAMP. Employees shall sign a statement acknowledging their receipt of the CHAMP.

This requirement will assure that all golf course employees are familiar with the specific maintenance controls developed for the Resort at Squaw Creek.

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4.2.4 The golf course superintendent shall be responsible for proper staffing with qualified personnel.

The CHAMP is a carefully planned document designed specifically for the project. Compliance with the CHAMP will be necessary to reduce the potential impacts to the Squaw Valley waters.

4.2.5 All personnel involved in the management and application of chemicals shall receive initial site health and safety training regarding the storage, handling, application, decontamination and spill control procedures. All employees shall sign a statement acknowledging receipt of the prescribed training as regulated by the California Food and Agriculture, Worker Health and Safety Program (Reference Addendum XI).

Proper training of personnel is a critical step in providing personnel safety and protection of the environment. This subject deserves attention beyond the concerns of chemical handling and application and should include safety of all components of golf course maintenance.

4.2.6 This document will be followed explicitly with respect to the type of herbicides, fungicides, fertilizers, and application rates approved for use in the CHAMP. Any change from the document must be approved by the Lahontan Regional Water Quality Control Board (RWQCB) and Placer County Division of Environmental Health (DOEH) and the Technical Review Committee (TRC).

The Lahontan RWQCB and Placer County Department of Health are the two regulatory bodies directly responsible for the protection of the Squaw Valley environment. The notification of the TRC members is to allow technical input in the decision making process.

4.2.7 Course management shall be responsible for maintaining records on all maintenance of the course.

The project and its proximity to the Squaw Valley aquifer will require accurate documentation of all maintenance, particularly chemical applications associated with the project, to facilitate monitoring of the environmental impact associated with the project. The format of such maintenance records shall include daily written entries relative to work performed on the project and will also be the basis for monthly reporting. Monthly reports are to be as detailed and specific as possible. All reporting details stipulated by Lahontan's Revised Monitoring and Reporting Program No. 87-102 shall be satisfied to the extent possible (see Addendum I).

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4.2.8 An inspection of the project shall be made by the operator on a monthly basis during those months in which ground cover by snow is not complete.

The purpose of this investigation is to discover potential erosion and surface runoff problems on the project site so that corrective measures may be immediately undertaken. The inspection shall include at least the following:

1. Infiltration Trenches
 - a. Clogging of inlet pipes by debris
 - b. Accumulation of sediment
 - c. Disrepair of trenches
 - d. Runoff movement into infiltration trenches
 - e. Damage by vehicles
2. Drop Inlets
 - a. Clogging by debris, ice, or sediment
 - b. Runoff movement into the infiltration gallery
 - c. Damage by vehicles or snow plow equipment
3. Drainage Collection System
 - a. Clogging by debris, ice, or sediment
 - b. Free movement of water through pipes, channels, and appurtenances
 - c. Damage
4. Erosion Control
 - a. Healthy and productive vegetation
 - b. Gully or nil erosion on slopes
 - c. Sediment buildup at toe of slopes
 - d. Vegetation damage by vehicles or heavy foot traffic
 - e. Bare areas in need of revegetation
5. General
 - a. Accumulated debris (pine needles, refuse, etc.) on parking areas and roof tops
 - b. Illicitly dumped wastes from recreation vehicles
 - c. Illicitly dumped oil and gasoline from vehicles; spilled chemicals

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- d. Illicitly dumped or discharged grease, cooking oil, non-specification product or product component
- e. Parking and traffic area restrictions in place

4.2.9 Records shall be kept on an ongoing basis of the use of herbicides and fungicides.

The records will include entries with the following:

- 1. Herbicides/Fungicides:
 - a. Herbicides/Fungicides Purchased
 - (1) Each type of herbicide/fungicide purchased
 - (2) Amount of each type of herbicide/fungicide purchased
 - (3) Date of each purchase
 - (4) Place of purchase
 - (5) Date of onsite arrival of herbicide/fungicide purchased
 - (6) Onsite storage location of herbicide/fungicide purchased
 - b. Herbicide/Fungicide Application
 - (1) Types of herbicide/fungicide applied
 - (2) Locations of application
 - (3) Dates of application
 - (4) Amounts of application
 - (5) Method of application
 - (6) Name of person(s) responsible for application

4.2.10 All herbicides/fungicides which arrive at the project site shall not be stockpiled onsite for any longer than a period of 30 days.

Herbicides/fungicides stockpiled onsite shall be removed from the project site after 30 days and the following shall be reported:

- 1. Type of herbicide/fungicide removed from the project site
- 2. Amount of herbicide/fungicide removed from the project site
- 3. Location of herbicide/fungicide disposal

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4.2.11 The golf course operator shall notify the Lahontan Regional Board staff and the TRC prior to the use of application of any herbicide/fungicide. Advance notification shall be provided to allow Regional Board staff and the TRC to be present onsite at the time the fungicide or herbicide use or application is proposed.

4.2.12 The golf course operator shall carefully control and inspect the irrigation system prior to use of any herbicide/fungicide to preclude saturation of areas subject to irrigation from occurring due to improper irrigation system maintenance.

4.2.13 The golf course operator shall check projected weather forecasts with the National Weather Service (916-442-1468) prior to use of herbicides or fungicides. If adverse weather conditions are anticipated within five days of application, use of the herbicide/ fungicide shall be postponed. Adverse weather conditions would include a forecast predicting precipitation in excess of a trace amount with a probability of occurrence exceeding 10 percent.

4.2.14 The golf course operator shall immediately notify Regional Board staff, the Placer County DEH, and the TRC whenever an adverse condition exists. An adverse condition shall include, but not be limited to, any herbicide/fungicide spills; losses or thefts of herbicides/fungicides; excessive application of herbicides/fungicides; or any unauthorized uses of herbicides/fungicides. The Regional Board shall also be notified whenever adverse weather conditions occur within 15 days following the application of any herbicide, especially Weed-B-Con. A written report shall follow detailing the reasons for the adverse condition and procedures to alleviate the adverse condition.

4.2.15 The use of fertilizers shall be recorded.

The records shall reflect the following:

1. Locations of applications
2. Type of fertilizer applied
3. Amounts of applications
 - a. Total pounds
 - b. Pounds per acre
4. Dates of application
5. Composition of the fertilizer

4.2.16 Management shall have the sole responsibility for providing expertise, approved materials, supplies and action in the matters of pest control on the course. An ongoing program of rodent control using mechanical methods shall be implemented. The management program shall keep the course relatively free of vertebrate pests such as gophers, ground squirrels, moles, etc., and shall maintain control programs for insects, fungi, and weed pests in accordance with the guidelines presented in the CHAMP.

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Purchasing of equipment and supplies for pest control must be under the direct supervision of the management. The management is responsible for the "playable" status of the course and the limited use of approved chemicals for pest control.

4.2.17 Weed control will utilize mechanical methods only. In the event that all practical mechanical methods fail to provide sufficient weed control, the golf course superintendent may apply Weed-B-Gon to the infested area as directed by the CHAMP. If such application is necessary, the drainage from the treated area will be isolated from the surrounding environment. This isolation process should be in effect for a minimum of three days after herbicide application. If surface waters accumulate in the isolated areas, the isolation process should continue until there is no remaining empounded water.

There is a potential for summer thundershowers to mobilize Weed-B-Gon shortly after application. To minimize the potential for Weed-B-Gon to impact the surrounding surface water, all drainages into and away from the treated area should be blocked. We envision this could be accomplished using sand bags to block the drainage and adequately sized sump pumps to divert upslope runoff and recirculate runoff from the treated area.

4.2.18 All restrictions listed in Lahontan Board Order 6-87-102 shall be strictly enforced. No application or method described in the CHAMP shall supersede the specifications of the Lahontan Order.

4.2.19 Pest control in rough areas will use mechanical methods only.

This restriction assures that if chemicals are used they will not be applied outside of the maintained turf areas. Since rough areas may be adjacent to surface water bodies, the application of chemicals to these areas could increase the chance of impacting water quality.

4.2.20 Pest control in sand trap areas will use mechanical methods only. When sand traps are constructed with underdrains, then herbicide shall not be applied within 10 feet of those sand traps.

The intent is to prevent access of herbicides to surface water bodies.

4.2.21 Fertilizer, fungicide or herbicide application to pond, stream or wetland environments is prohibited.

Any chemical application to a surface water area will be in direct violation of Lahontan Board Order 6-87-102.

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4.2.22 The operator will inform each TRC member if any approved herbicide or fungicide (or their toxic metabolites, breakdown products or derivatives) is detected by the monitoring program. The operator must report the location and concentration of the detection.

4.2.23 In the event that an approved herbicide or fungicide is detected in surface or ground water sampling, its further use is prohibited until and unless the operator can demonstrate the contamination resulted from an activity other than the approved application, or a revised request for use is approved.

4.2.24 The TRC may authorize interim use of a detected herbicide, and may impose restrictions to prevent further contamination.

4.2.25 After the first instance of detection, the operator may submit a revised request for use. The request may propose an alternate herbicide or fungicide (less mobile and persistent than the original compound), or place additional geographic or concentration restrictions on the same compound. The TRC will recommend whether this revised request should be approved.

4.2.26 The TRC must determine whether implementation of the revised request will cause further contamination.

4.2.27 If a revised request proposing use of the same herbicide or fungicide at a lower concentration is accepted, and that substance is subsequently detected a second time, its use will be immediately suspended and prohibited.

4.2.28 If a revised request proposing use of a less mobile, less persistent herbicide or fungicide is accepted, and that compound is detected at the same sampling station as the initial detection, no further use of any herbicide or fungicide will be allowed in that area or in areas of similar soil and hydrogeologic conditions, as determined by the TRC.

4.2.29 If a revised request proposing use of a less mobile, less persistent herbicide or fungicide is accepted, and that compound is detected at a different sampling station than the initial detection, no further use of any previously detected herbicide or fungicide will be allowed in the project area.

4.2.30 The operator may submit a second revised request to the TRC, following a second detection, proposing use of another herbicide or fungicide of substantially lower mobility and persistence than either previously detected substances. The TRC will recommend whether this revised request should be approved.

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4.2.31 If the second revised request is approved and the herbicide or fungicide is detected in the monitoring system, no further use of any herbicide or fungicide (whichever is applicable) shall be allowed in the project area.

4.2.32 In addition to the provisions set forth in 4.2.22 - 4.2.31, no further use of any fungicide or herbicide shall be allowed if any of the following occur:

- **three instances of herbicide, one instance of fungicide contamination**
- **three instances of fungicide, one instance of herbicide contamination**
- **two instances of herbicide, two instances of fungicide contamination**

4.2.33 If a modification, reduction, or cessation of herbicide, fungicide, or fertilizer use is required, neither PCDEH nor the Placer County Board of Supervisors have the power to waive the required modification, reduction, or cessation.

4.2.34 If any herbicide or fungicide in use on the golf course is detected in drinking water wells, further use of all herbicides and fungicides shall be prohibited unless it can be shown that the contamination did not occur as a result of approved application of herbicides or fungicides to the golf course.

4.2.35 Placer County may be requested to conduct an investigation into any alleged tampering of monitoring program samples and may order an independent firm conduct the program or that additional safeguards be instituted.

4.3 General Maintenance Activities

4.3.1 All drainage collection and installed treatment systems shall be inspected weekly during the irrigation season and every other week during the off season, except when snow cover is complete or prohibits access.

The systems will be inspected for leaks, sediment buildup and algae growth. Any detrimental condition reported shall be dealt with immediately using mechanical repair and cleanup methods only. It is essential that these systems remain in proper operating condition at all times to prevent unauthorized discharges.

4.3.2 All greens drainage collection and installed treatment systems shall be inspected and in proper operating conditions prior to application of any fungicide, herbicide or fertilizer.

The proper operation of the drainage collection and treatment systems is critical during the days and weeks following the chemical application.

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4.3.3 No chemical additives will be used to clean or maintain any portion of the drainage collection or installed treatment systems.

The use of chemicals is strictly limited to those products described in Section 4 of this chapter. All maintenance of the drainage systems must be conducted with mechanical methods.

4.3.4 At least three times per year, the discharge from three representative greens shall be sampled during the spring melt/runoff season. The samples shall be taken from the discharge of the carbon filters, and should be analyzed for chloroneb, nitrate as N, total nitrogen, total phosphorus, pH and specific conductance. Analysis of total organic carbon (TOC) may be substituted for chloroneb analysis once a correlation between the two has been established. Samples shall be collected by a person with at least two years of water quality experience. Samples will be taken to a California certified laboratory for analysis. These results should be submitted to the golf course operator and permanently kept on file.

The test results will provide additional information to help evaluate the efficiency of the proposed design.

4.3.5 Basket devices for catching grass clippings shall be used on mowers except for the first mowing after a green has been top dressed or fertilized. All clippings will be disposed of offsite at an approved disposal facility. To the extent possible, clippings should not be allowed to enter any surface water body.

4.3.6 Not less than once a year, management shall have nutrient and fungicide testing performed on at least three representative greens, tees, and fairways as a means of providing guidance for the fertilization and fungicide program. Results of the testing shall be submitted to the golf course superintendent and permanently maintained on file. Fungicide (Chloroneb) testing will be performed three times a year and will involve soil plugs from greens only. Analysis may be of total organic carbon (TOC) rather than Chloroneb once a correlation is established.

4.3.7 Should fungicide or herbicide testing of greens show elevated levels of Chloroneb, 2,4-D, or glyphosate, application levels will be reduced in an amount sufficient to offset the residual amounts of these compounds.

4.3.8 The snow pack overlying greens, fairways and tees shall be managed to minimize the need for fungicides and herbicides during the growing season and reduce snow melt infiltration.

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4.3.9 Where maintenance tasks are specified to be performed on a scheduled basis (i.e. daily, every other day. etc.) management will not be expected to perform the task on the specified schedule if the performance of the task is precluded by weather or other unforeseeable or adverse conditions. The tasks shall be performed on the next available day on which weather or other conditions will not interfere with the reasonable performance of the task.

4.3.10 At no time shall fertilizers, fungicides or herbicides be applied to areas with standing water.

4.3.11 The project site shall be checked daily for fungus growth, insect infestations, weed invasion or any other pest problem. The appropriate mechanical controls for these conditions shall be applied as soon as necessary after their detection.

In order to minimize the need to use chemical controls, preventive maintenance is necessary.

4.3.12 When possible, all waste chemical solutions and cleanup rinse water shall be reapplied to the golf course in the approved manner.

The intent is to minimize the waste requiring disposal.

4.4 Prohibited Chemicals, Approved Chemicals and Maximum Application Rates

This section presents a comprehensive listing of the chemicals and fertilizers approved for use on the projects. In addition, the fungicides, herbicides, rodenticides and insecticides prohibited for use are also presented. The rationale for the list of prohibited chemicals is presented in Volume II of this report.

The maximum application rates of the approved chemicals and fertilizers presented in this section have been established based on the results of a toxicological evaluation (Volume II) and the results of laboratory column testing and the operation of the test green (Addendum X).

4.4.1 Prohibited Chemicals

The listing of chemicals prohibited for use on the project are listed below:

Fungicides:

Anilazine (Dyrene)-4,6-dichloro-N-(2-chlorophenyl)-1,3,5-triazin-2-amine

Benomyl - Carbamic acid, (1-((butylamino)carbonyl)-1H-benzimidazol-2-yl)-methyl ester

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Captan - 1H-isoindole-1,3(2H)-dione,3a4,7,7a-tetrahydro-2-(trichloromethyl)thio)

Copper metallic

Chlorothalonil (Daconil) - tetrachloroisophthalonitrile

Cycloheximide (Actidione) - 2,6-piperidinedione,4-(2-(3,5-dimethyl-2-oxocyclohexyl)-hydroxyethyl)-(1S-1 alpha(S),3 alpha, 5 beta

Dinocap (Karathane) - 2,4-dinitro-6-octyl-phenyl crotonate, 2,6-dinitro-4-octyl-phenyl crotonate, and nitro octyl phenyls (principally dinitro), a mixture of 1-methylheptyl, 1-ethylheptyl and 1-propyl pentyl isomers of the octyl 8-carbon chain

Fenarimol - a-(2-chlorophenyl)-a-(4-chlorophenyl)-5-pyrimidine methanal

Iprodione-3-(3,5-dichlorophenyl)-N-(1-methylethyl)2,4,-dioxo-1-imidazolidinecarboxamide

Lime sulfur - calcium polysulfides

Mancozeb (Dithane) - ((1,2-ethanediylbis (carbamodithioate)) 2-manganese mixture with ((1,2-ethanediylbis (carbamodithioate))(2-))zinc

Maneb - ((1,2-ethanediylbis(carbamodithioate))(2-))manganese

Metalaxyl - N-(2,6-dimethylphenyl)-N-(methoxyacetyl)-alaninemethylester

PCNB (terraclor) - pentachloronitrobenzene

PMA (Agrosan) - phenylmercuriacetate

Sulfur

Thiophanate (Topsin E) - 1,2,-bis(3-ethoxycarbonyl-2-thioureido)benzene

Thiophanate methyl - dimethyl((1,2,-phenylene)bis(imino carbanothioyl))bis (carbamate)4,4,-o-phenylenebis (3-thioallaphante)

Thiram - bis (dimethylthio-carbamoyl)disulfide

Triadimefon - 1-(4-chlorophenoxy)-3,3-dimethyl-1-(1H- 1,2,4-triazol-1yl)-2-butanone

Zineb - zincethylenebisdithiocarbamate

Herbicides:

Ammonium Sulfamate

Benefin (Balan) - N-butyl-N-ethyl-2,6-dinitro-4-(tri-fluoromethyl)-benzene amine

Bensulide - o,o-bis(1-methylethyl)-S-2(phenylsulfonyl)amino)ethyl)esterphosphorodithioic acid

Calcium acid methane arsonate (CMA)

DCPA (Dacthal) - dimethyltetrachloroterephthalate

Dicamba (Banvel) - 3,6-dichloro-2-methoxy-benzoic acid

Dichlobenil - 2,6-dichlorobenzonitrile

Dichlorprop - 2-(2,4-dichlorophenoxy)propanoic acid

Diphanamid - (N,N-dimethyl-2,2-diphenyl-acetamide)

Diquat dibromide (Reglone) - 6,7-dihydrodipyridine-1,2-a:2,1-C)pyrazinediium dibromide

Diuron - 3-(3,4-dichlorophenyl)-1,1-dimethylurea

Dodecylammoniummethanearsonate

DMAA (Cacodylic acid) - dimethylarsenic acid

DSMA (Sodium Cacodylate) - disodiummethanearsonate

Endothall - (7-oxabicyclo(2,2,1)heptane-2,3,-dicarboxylic acid

EPTC (Eptam) - S-ethylpropylthiocarbamate

Ethofumesate (Northron) - (2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranylmethanesulfonate)

MCPA (Metaxon) - 4-chloro-2-methylphenoxyacetic acid

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Metribuzin (Sencor) - 4-Amino-6-(1, 1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5(4H)-one

Monuron - N-(4-chlorophenyl)-N,N-dimethylurea

MSMA (Buenol) - monosodiumacidmethanearsonate

Nuburon (Granurex) - N-butyl-N-(3,4-dichlorophenyl)-N-methyl urea

Oxadiazon - 1,3,4-oxadiazol-2(DH)-one,3-(2,4-dichloro-5-(1-methylethoxy)phenyl)-5-(1,1-dimethylethyl)

Oxyfluorfen - 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)-benzene

Pendimethalin - 3,4-dimethyl-N-(1-methylpropyl)-2,6-dinitrobenzene amine

Potassium Cyanate

Prometon (Pramitol) - 2,4-bis(isopropylamino)-6-methoxy-5-triazine

Siduron (Tupersan) - N-(2-methylcyclohexyl)-N-phenyl urea

Sodium Chlorate

Sodium Thiocyanate

Triclopyr - (3,5,6-trichloro-2-pyridinyl)oxyacetic acid

Trifluralin - a,a,a-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine

Insecticides and Miscellaneous Pesticides:

Carbaryl (Sevin) - 1-naphthyl-N-methylcarbamate

Chlordane technical - 4,7-methano-1H-indene-1,2,3,4,5,6,7,8-octachloro-2,3,3a,4,7,7a-hexahydro-isomers

Chlorophyrifos (Dursban) - o,o-diethyl-o-(3,5,6-trichloro-2,pyridyl)phosphorothioate

Citronella oil

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Diazinon - o,o-diethyl-o-(2-isopropyl-6-methyl-4-pyrimidinyl)phosphorodithioate

Dichlorvos (DDVP) - 2,2-dichlorovinylmethylphosphate

Dicofol (Kelthane) - 4-chloro-alpha(4-chlorophenyl)-alpha-(trichloromethyl)-benzene
methanol

Disulfoton (di-syston) - o,o-diethyl-5-(2-(ethylthio)ethyl)phosphorodithioate

Ethoprop (Mocap) - o-ethyl-5,5-diprophyphosphorodithioate

Lethane 384 - 2-(2-butoxyethoxy)ethylester thiocyanic acid

Malathion (Sumitox) - mercapto-diethylester succinic acid. S-ester with o,o-
dimethylphosphorodithioate

Metaldehyde - 2,4,6,8-tetramethyl-1,3,5,7-tetrasocane

Methiocarb (Mesurol) - 4-(methylthio)-3,5-xylylmethyl carbamate

Methoxychlor technical - 1,1-(2,2,2-trichloroethylidene)bis(4-methoxybenzene and 1-
methoxy-2-(2,2,2-trichloro-1-(4-methoxyphenyl)ethyl)benzene

Methyl Demton (Meta-systox) - S-2(ethyl sulfinyl)ethyl o,o-dimethylphosphorothioate

Milky Spore Powder - Bacillus popilliae Dutky

Naphthalene

Nosema locustae spores

Piperonyl butoxide - 1,3-benzodioxole,5-((2-butoxy ethoxy)ethoxy)methyl)-6-propyl

Trichlorfon (Dylox) - dimethyl(2,2,2-trichloro-1-hydroxy ethyl)phosphonate

4.4.2 Chemicals Approved for Use

Herbicides may be considered for use only after all mechanical control methods have proven ineffective. If fungicides are to be used, a surface water and leachate treatment system shall be installed as specified in Section 3.4.6 of this document.

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The following is a comprehensive listing of all herbicides, fungicides and fertilizers allowed for use on the project.

Herbicides:

- 2,4-D: (2,4-dichlorophenoxyacetic acid), and MCPPP: 2-(2-methyl-4-chlorophenoxy) propionic acid, for the control of broadleaf plants (as found in Weed-B-Gon by Ortho). The use of any herbicide containing 2,4-D will be voluntarily suspended for a period not exceeding 180 days from the date of approval of the CHAMP to allow the State of California a reasonable length of time to complete its review of Proposition 65 chemicals including 2,4-D.
- Glyphosate for spot eradication of weeds (as found in Roundup by Monsanto).
- Clopyralid for spot eradication of clover and dandelions (as found in Lontrel by Dow AgroSciences).

Fungicides:

- Chloroneb for control of gray snow mold during winter months (as found in Fungicide II by Scotts).

Insecticides:

- none

Rodenticides:

- none

Fertilizers:

See Section 5.3, Fertilizer Use and Schedule, for acceptable application procedures.

- Scotts Starter 19-26-5 or equivalent
- Scotts High Density 22-0-16 or equivalent
- Scotts Super Greens Fertilizer 19-0-17 or equivalent
- Scotts H.D. Nitrogen Plus 31-0-0 or equivalent
- Scotts Turf Fertilizer w/SREF 34-3-7 or equivalent
- Scotts High K Fertilizer 16-0-30 or equivalent
- Isobutylidene Diurea (IBDU)
- NatureSafe
- Sustane (Natural Organic and Natural Base)

Other fertilizer type products approved for use are:

- Ferrous Sulfate (FeSO_4)
- Potassium Sulfate (K_2SO_4)
- Gypsum, Calcium Sulfate (CaSO_4)
- Dolomite Limestone

Information on the potential health and antagonistic effects of these chemicals is presented in Volume II of this document.

4.4.3 Maximum Application Rates

4.4.3.1 Fungicide Application

4.4.3.1.1 Fungicide in the form of chloroneb may be applied once per year to the green areas only. The manufacture's prescribed application rate of 32.75 lbs./5,500 ft² (approximately 6 lbs./1,000 ft²) for areas of persistent snow cover shall be strictly observed. Any areas with excess application shall be raked to distribute the product evenly or vacuummed to remove excess applications.

The test green program indicated that careful distribution of the product is essential to its efficiency. Applying an excess amount increases the probability of runoff of product rather than reducing the effects of gray snow mold.

4.4.3.1.2 At no time shall maintenance personnel transport and/or distribution vehicles contain active fungicide ingredients in excess of 25 pounds (11.3 kilograms) of chloroneb (as found in Fungicide II).

This amount of product should allow for several greens to be treated in one trip, yet minimize the amount of material on hand if an accidental spill occurs.

4.4.3.1.3 The granular form of Fungicide II (chloroneb) shall be applied using a spreader type of applicator to facilitate an even distribution.

4.4.3.1.4 If possible, an "ice blanket" should be laid over the treated area immediately after application.

The blanket may be useful in mitigating the effects of snow melt and rain runoff.

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4.4.3.2 Herbicide Application

4.4.3.2.1 Weed control will be accomplished by mechanical methods only. In the event all practical mechanical methods fail to produce sufficient weed control, the golf course superintendent may apply approved herbicides in the form of 2,4-D (Weed-B-Gon)* glyphosate (Roundup) and clopyralid (Lontrel) to maintained, fertilized fairway and tee areas only. At no time shall any herbicide be applied to any green or rough areas, any unfertilized play areas, any natural vegetation or wetland and surface water area.

4.4.3.2.2 The manufacture's prescribed application rates shall be strictly observed.

The current manufacture's application rates are provided below:

- Weed-B-Gon by Ortho* = 3.3 oz. (20 teaspoons) per 1 gallon per 1000 ft² spot application only (limited to an area no larger than 5000 square feet).
- Roundup by Monsanto (glyphosate) = 6 oz. per 1 gallon.
- Lontrel by Dow AgroScience = 1/8 to 1/5 oz. per gallon per 1,000 ft²; spot application only to clumps of clover or individual dandelions.

4.4.3.2.3 All herbicides shall be applied in liquid form only. The "weed and feed" type granular products should not be applied. The treatment shall be conducted using hand-trigger applicators only. Do not use hose end sprayers.

4.4.3.2.4 At no time shall maintenance personnel transport herbicide application mixtures (as described in 4.4.3.2.2) in excess of:

- **2,4-D and MCPP (as found in Weed-B-Gon) prescribed application mixtures in the amount of 10 gallons (37.5 liters).**
- **Glyphosate (as found in Roundup) prescribed application mixtures in the amount of 10 gallons (37.5 liters).**
- **Clopyralid (as found in Lontrel) prescribed application mixtures in the amount of 10 gallons (37.5 liters).**

4.4.3.2.5 No irrigation shall be allowed on the treated area(s) within 48 hours following application.

The active chemicals in these products must remain in contact with the foliage to be effective. In addition, the test green program indicated that traces of Weed-B-Gon product can be mobilized with excessive water application.

*The use of any herbicide containing "2,4-D" will be voluntarily suspended for a period not exceeding 180 days from the date of approval of the CHAMP to allow the State of California a reasonable length of time to complete its review of Proposition 65 chemicals including 2,4-D.

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4.4.3.2.6 Herbicides may be applied only if the operator has submitted to the TRC, Placer County Department of Environmental Health (hereinafter "Placer County DEH"), and the Lahontan Executive Officer and the Placer County DEH have approved the request, following a positive recommendation from the TRC. The TRC may recommend approval if it finds that:

(i) The operator has used all reasonable mechanical means to control the spread of unwanted broadleaf plants, including daily inspection of fairways and removal of weeds. If daily mechanical removal is insufficient to control weed infestation, the operator, prior to requesting permission to apply herbicides, shall attempt to control the infestation by a significantly intensified application of mechanical means. Mechanical means of weed removal shall not be deemed unreasonable simply because they are more expensive than chemical application;

(ii) The infestation of unwanted broadleaf plants continues to spread; and

(iii) If herbicide application is not approved, the continued spread of broadleaf plants will adversely affect the quality of play on the golf course.

Herbicides shall not be applied in concentrations, amounts, or frequencies greater than those specified in the Chemical Management Plan. The TRC shall specify further restrictions on the use of herbicides in reviewing a request for use, such as the location in which use is approved, the number of applications allowed, and the duration of the approval.

The TRC may specify additional mechanical means of weed control, over and above those already employed by the operator, be employed prior to approving herbicide use.

The TRC shall act on the operator's request for permission to use herbicides within five days of receipt. The TRC shall meet, if feasible, to consider the operator's request. If a meeting of all members is not feasible, those who cannot attend shall attend by teleconference if they are available. If it is impossible to obtain the physical or telephonic presence of a majority of the TRC members within five days of submission of the operator's request for use, the operator may poll the TRC members individually by telephone. TRC members shall make every reasonable effort to view the golf course prior to making a decision on the operator's request. The operator shall confirm the results of a meeting or telephone poll by written memorandum to all TRC members immediately following the meeting or poll. Following approved applications, the operator shall provide TRC members with a written report specifying actions taken and results achieved.

4.4.3.2.7 The TRC may recommend to Lahontan RWOCB or PCDEH additional restrictions or limitations on allowable concentrations of fungicide if necessary.

4.4.3.3 Fertilizer Application

4.4.3.3.1 Fertilizers are considered as any substance, either chemically processed or natural organic matter, that is applied to enhance and enrich the growth of the golf course turf.

4.4.3.3.2 The application of fertilizers to areas of natural vegetation between the golf course tees, fairways, and green islands is prohibited throughout the golf course. In addition, the application of fertilizers to any portion of the golf course located within the post-project 100-year flood plain is also prohibited. (Attachment C, Sierra Club Settlement)

These areas must be left in a natural condition to minimize the impact on the valley vegetation, wildlife, aesthetics and water resources. Additionally, by not fertilizing natural vegetation, pest habitat adjacent to the golf course area will be subject to natural controls.

4.4.3.3.3 All fertilizing activities shall be conducted in compliance with Lahontan Board Order No. 6-87-102, Item I.D.13 which states the following:

“The types and amounts of fertilizer to be applied on the golf course shall not differ in types or exceed amounts specified in the information contained in the submitted report entitled “Golf Course Maintenance Proposal” prepared by John Stanowski (see Addendum XII, Volume III). The Executive Officer may approve changes in the types or amounts of fertilizers as a result of information from the demonstration project set forth in I.D.23., provided that changes in the amount of fertilizer used may be approved only if the discharger provides clear and convincing evidence that the changed application (i) is necessary to prevent significant adverse effects on the quality of play on the golf course and (ii) will not violate the levels specified in I.A.1. and I.B.5. In the event the Ground Water Monitoring Program detects concentrations of nitrate nitrogen in excess of the receiving water standards set forth in I.B.1., I.B.5. or I.B.6., unless it is demonstrated to the Executive Officer (of the LRWQCB) by the discharger that such concentrations were not due to the application of fertilizers to the golf course, the discharger shall, at least, immediately reduce the fertilizer application rates (in terms of amount of fertilizer per acre) 50 percent without increasing the frequency of fertilizer application. Prevention of ground water inflows to Squaw Creek by pumping or other means may be required to prevent violation of receiving water limitations for surface waters. If concentrations of nitrate nitrogen do not decline to the specified receiving water limitations within 90 days of the date they were first found to exceed that requirement, fertilization application rates shall, at least, be

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further reduced in accordance with the recommendation of the TRC. If concentrations persist in excess of specified receiving water limitations, fertilizer applications shall be discontinued until the specified receiving water limitations are met, and they then can be resumed at a rate specified by the TRC if approved by the Executive Officer. "Bi-weekly" shall be defined as occurring once every two weeks."

4.4.3.3.4 As specified by the Lahontan Board Order, the information on fertilization as contained in "Golf Course Maintenance Proposal" prepared by John Stanowski, shall be implemented.

Portions of the information referenced above is reprinted below.

"I. Fertilizer and Cultural Strategy

The following report is a recommendation to the Perini Land and Development Co. for use as a guide in the maintenance of a golf course in a Sierra meadowland environment.

The strategy being proposed, is decidedly a "lean and mean" approach. This is a philosophy based on scientific information, that turf is actually healthier when it is not fed as much nitrogen or watered as much as previously thought necessary. In combination with natural buffer zones and collection ponds to recycle irrigation water, the goal is to affect no degradation to the environment. Excessive nitrogen leads to disease susceptibility, depleted root structures and poor wear tolerance as well as to other stress factors such as heat, drought and cold. With the higher use of potassium instead we intend to strive for deeper and dense root structures and thicker more resilient cell walls of the vegetative portion of the turf. The turf may be less colorful although the use of iron will help provide the color that is lost.

Other cultural practices such as aerification, verticutting and topdressing will be maximized to keep turf in a healthier state and reduce the need for fungicides, insecticides, and herbicides. The annual use of soil tests will determine which adjustments should be made to the nutrient program and the additional need for micro nutrients."

The complete text of Mr. Stanowski's report is provided in Addendum XII of Volume III.

4.4.3.3.5 The greens are to be fertilized in increments of not more than 0.25 pounds of nitrogen per 1,000 square feet per bi-weekly application. This reflects the test green research which indicated approximately 66 to 70 percent of manufacture's bag strength application will sustain a hardy, playable growth.

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4.4.3.3.6 The greens are to be fertilized frequently enough to support constant growth which is correspondent to the particular season of the year. No more than 3.5 pounds total of nitrogen per 1,000 square feet per year are to be applied, as per Addendum X of Volume III. Table 4-3. Fertilizer Application Record (0.5 lbs. N/1,000 sq. ft. x 7 applications).

This application restriction, together with 4.4.3.3.5, allows for bi-weekly fertilizer applications over the five month growing season of May to September (approximately 13 applications). The total amount of nitrogen from these bi-weekly applications must not exceed 3.5 pounds total nitrogen per 1000 ft² per year.

4.4.3.3.7 Applications of fertilizer shall not begin until soil temperatures exceed 45 degrees (F) for three consecutive days. Fertilizer applications must end when soil temperatures remain below 45 degrees for more than three consecutive days (Placer County Conditions of Approval No. 104). Temperatures shall be read with a stainless steel stem thermometer at a depth of 4 to 6 inches.

4.4.3.3.8 Fertilizer shall not be applied within 25 feet of Squaw Creek or other perennial streams (Placer County Conditions of Approval No. 104).

4.4.3.3.9 The fairways, tees and aprons are to be fertilized frequently enough to support constant growth which is correspondent to the particular season of the year. The fairways are to be fertilized not more than three times per year with not more than a total of two pounds of nitrogen per 1,000 square feet per year to be applied.

As described in Item 4.4.3.3.5 above, the test green research indicates that an application of 0.66 of the manufacture's recommended strength is adequate. This rate should be adjusted seasonally based on the specified soil test results.

4.4.3.3.10 Any fairway, tee or green areas that require repair or revegetation due to winter freeze, disease or other complete damage, and will require an additional fertilizer application to recover growth must first be approved by the Lahontan Executive Officer of the LRWQCB. In any case, not more than six pounds of Nitrogen per 1,000 square foot should be allowed and only until the damaged area is recovered.

4.4.3.3.11 Any proposed change in the amount or type of fertilizer to be used shall be reported to the Lahontan Regional Board at least 10 days in advance of implementation of any such proposal.

4.4.3.3.12 When feasible, new sod should be used to replace damaged areas as described in Section 4.4.3.3.10.

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4.4.3.4 Irrigation

4.4.3.4.1 Direct irrigation of endemic flora (natural vegetation) will not be allowed.

The growth in the surrounding natural areas must be allowed to follow its normal cycle. Irrigating natural areas will only promote the growth of uncontrolled vegetation such as weeds and enhance the available habitat for animal and insect pests, thus leading to further pest control problems.

4.4.3.4.2 The maximum irrigation rate will be 1.5 inches per week.

This rate should be considered as a maximum and adjusted during the growing season as the geographic location, climatic trends and turf requirements demand. The field research and testing has demonstrated that this irrigation rate can support playable conditions. Any change from this irrigation rate will require the approval of Lahontan RWQCB.

4.4.3.4.3 The irrigation systems shall maximize the even distribution of water to all irrigated areas. No area should exceed the maximum application rate by more than 15 percent.

Irrigation of areas in the meadow, and landscaped areas adjacent to buildings and paved areas should be based on actual needs of vegetation. Water application shall be controlled as not to allow ponding, water-logging, or run-off, particularly after fertilizer applications (Placer County Conditions of Approval No. 111).

4.4.3.4.4 All irrigation practices shall be conducted in accordance with the "Golf Course Maintenance Proposal" report provided in Addendum XII of Volume III.

The golf course maintenance plan was prepared specifically for the Resort at Squaw Creek and approved by the Lahontan RWQCB. The irrigation guidelines presented in the referenced maintenance plan are as follows:

"The greatest potential for erosion would occur during the construction phase. However, great care has been taken in the planning of this project to minimize erosion. Irrigation practices will also play a significant role during the establishment phase of the turf.

Irrigation can help in the stabilization of newly graded soils. Light, frequent cycles help prevent wind erosion and serve to settle the soil. During seeding establishment, light, frequent cycles are necessary throughout the day to insure germination. Plant root structures are immature and deep watering is of no use. After the turf is established and then when the course opens, mid-day waterings give way to nightly cycles. Once again using repeat cycles will

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reduce run-off. Deeper penetration will be achieved in this manner to aid in root elongation.

Any irrigation system for this project will certainly have multiple repeat capacity. Many have the capacity for a daily percentage addition or reduction of total watering time based on daily fluctuations in the evapotranspiration rate. The superintendent can adjust according to his assessment or by the use of soil tensiometers and evaporation pans.

An average nightly watering in this area during peak periods would be about 16 minutes. Some runoff will likely occur unless this is done for example, in four cycles of four minutes each. Soil and thatch are very often hydrophobic at first and initial wetting makes subsequent watering more effective.

Irrigation can also be used as a tool to favor desirable turf grass species. Those that can tolerate drying out are more desirable than those that can't. Therefore purposely stressing turf by not watering at times can be beneficial.

Turfs that do better in water logged, anaerobic soils do better because of shorter root systems. Waterlogged soils are impossible to manage and therefore so are the turfs that flourish there."

CHAPTER 5

5.0 PROJECT OPERATIONS MANUAL

5.1 General

This chapter is designed as a manual to be followed during the operation of the project. Each item contained in this section shall be followed by all personnel providing services to the project. The rationale behind each item has been explained in previous sections of this document, primarily Chapter 4. It is the intent that each employee working on the project receive a copy and understand the contents of this chapter.

The help clarify some terms, the following definitions are given:

CHAMP - Chemical Application Management Plan. Its purpose is to provide technical public disclosure regarding the proposed fertilizers and chemicals to be used on the golf course, the methods of application, limitations on use, and known information regarding the potential health hazards of those chemicals.

Chloroneb - Chloroneb is a white, solid fungicide used to control gray snow mold during winter months. It is applied in the form of Fungicide II by Scotts as a solid adsorbed to ground corn cobs for even distribution. It is the only fungicide approved for use on the project.

Glyphosate - Glyphosate, (as found in Roundup by Monsanto) is a herbicide used for spot eradication of weeds. It will only be used on maintained fairways and tees. It is applied as a dilute spray consisting of glyphosate, a detergent and water.

Golf Course Operator - The golf course superintendent or his appointed representative.

Mecoprop (MCP) - One of two active ingredients found in Weed-B-Gon by Ortho. It is used to control broadleaf plants.

Pesticide - As used in this CHAMP, pesticide refers only to the herbicides and fungicides approved for use on the project.

Project - The 18-hole golf course being constructed in connection with the Resort at Squaw Creek in Squaw Valley.

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Spot Application - The area of application not to exceed 5000 square feet.

TRC - Technical Review Committee, a review panel formed pursuant to the terms of the Placer County Condition of Approval and the Pierucci Settlement Memorandum.

2.4-D - 2,4-D is one of two active ingredients found in Weed-B-Gon by Ortho. It is used to control broadleaf plants. It should be noted that any herbicide containing 2,4-D will be voluntarily suspended from use for a period not exceeding 365 days from the date of approval of the CHAMP to allow the State of California a reasonable length of time to complete its review of Proposition 65 chemicals including 2,4-D.

5.2 Prohibitions and Mandates

5.2.1 All personnel involved in the management and application of chemicals shall receive initial site health and safety training regarding the storage, handling, application, decontamination and spill control procedures. All employees shall sign a statement acknowledging receipt of the prescribed training as regulated by the California Food and Agriculture, Worker Health and Safety Program (Reference Addendum XI of Volume III).

5.2.2 This document will be followed with respect to the type of herbicides, fungicides or fertilizers, or application rates approved for use in the CHAMP. Any change from the document must be approved by the Lahontan Regional Water Quality Control Board (RWQCB) and Placer County Division of Environmental Health (DOEH) and the Technical Review Committee (TRC).

5.2.3 The discharge of treated or untreated domestic wastewater, industrial waste, garbage or other solid wastes, or any deleterious material to the surface waters of the Truckee River Hydrologic Unit (i.e., any surface waters that may enter the Truckee River, through either surface or subsurface flow) is prohibited.

5.2.4 The discharge, attributable to human activities, of solid or liquid waste materials, including soil, silt, clay, sand, and other organic and earthen materials, to the surface waters of the Truckee River Hydrologic Unit is prohibited.

5.2.5 The discharge of oil, gasoline, diesel fuel, or any other petroleum derivative is prohibited.

5.2.6 The discharge to surface waters or ground waters of any toxic chemical or hazardous waste is prohibited.

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5.2.7 The use, storage, discharge, or stockpiling of any insecticides, algicides, or rodenticides is prohibited.

5.2.8 Weed control will be accomplished by mechanical methods only. In the event all practical mechanical methods fail to produce sufficient weed control, the golf course superintendent may determine an application of Weed-B-Gon or Roundup is necessary. In the event of herbicide application, the drainage from the treated area will be isolated from the surrounding environment. This isolation process should be in effect for a minimum of three days after herbicide application. If surface waters accumulate in the isolated areas, the isolation process should continue until there is no remaining compounded water.

5.2.9 No fungicide, herbicide, rodenticide or insecticide, approved or otherwise, shall be applied to green 17 at any time, regardless of the circumstances.

5.2.10 All maintenance chemicals should be prepared, handled and applied by person(s) possessing a valid California Qualified Applicator or Advisor License and/or Certification.

5.2.11 Maintenance chemicals should not be used under any circumstances without the full knowledge and approval of the golf course superintendent or his appointed representative.

5.2.12 All accidental spills of any chemical shall be reported and cleaned up according to the information in Section 5.7 of this chapter.

5.2.13 The use or discharge of chemicals containing nitrogen or phosphorus (such as are used on ski slopes) for snow conditioning is prohibited.

5.2.14 Seeds to be used in the revegetation plan and for the establishment of the golf course turf shall not be pretreated with any pesticide.

5.2.15 In compliance with the Lahontan Board Order No. 6-87-102, temporary storage of approved fungicide(s) and herbicide(s) shall not exceed 30 days. To facilitate the temporary storage, a chemical holding area shall be designated at the site for the purpose of storing fungicides and herbicides. All unused chemicals shall be returned to the storage facility at the end of each work day.

5.2.16 At no time shall fertilizers, fungicides or herbicides be applied to areas with standing water.

5.2.17 When possible, all waste chemical solutions and cleanup rinse water shall be reapplied to the golf course in the approved manner as directed by the golf course superintendent. The intent is to minimize the waste requiring disposal.

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5.2.18 Fertilizer, fungicide or herbicide application to pond, stream or wetland environments is prohibited. Any chemical application to a surface water area will be in direct violation of Lahontan Board Order 6-87-102.

5.3 Fungicides and Herbicides

5.3.1 All fungicide applications will be limited to greens. Fungicides will only be applied at the direction of the golf course superintendent. No fungicides shall ever be applied to green #17. The only fungicide approved for use on the greens is Fungicide II by Scotts containing 6 percent chloroneb. No fungicide will be used on the fairways.

5.3.2 If fungicides are applied, all surface and subsurface drainage from each treated green will require treatment before discharging to the surrounding land surface. The treatment will consist of passing the drainage through an activated carbon contact chamber sized to adequately treat a volume of liquid resulting from a 20 year, one hour storm event. The purpose of the activated carbon will be to chemically adsorb organic compounds that may be found in the discharge.

5.3.3 Fungicide in the form of chloroneb may be applied only once per year to the green areas only. The manufacture's prescribed application rate of 32.75 lbs./5,500 ft² (approximately 6 lbs./1,000 ft²) for areas of persistent snow cover shall be strictly observed. Any areas with excess application shall be raked to distribute the product evenly or vacuumed to remove excess material.

5.3.4 The granular form of chloroneb shall be applied using a spreader type of applicator to facilitate an even distribution. If possible, an "ice blanket" should be laid over the treated area immediately after application. The blanket may be useful in mitigating the effects of snow melt and rain runoff.

5.3.5 Under no circumstances will any insecticides or rodenticides be used. The only herbicides approved for use are:

- Weed-B-Gon by Ortho* containing 10.8 percent 2,4-D and 11.6 percent MCPP
- Roundup by Monsanto containing 18 percent glyphosate
- Lontrel by Dow AgroSciences containing 40.9 percent clopyralid

*The use of any herbicide containing "2,4-D" will be voluntarily suspended for a period not exceeding 180 days from the date of approval of the CHAMP to allow the State of California a reasonable length of time to complete its review of Proposition 65 chemicals including 2,4-D.

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The prescribed herbicide application rates as provided by the manufacturer shall be less than:

- Weed-B-Gon* = 3.3 oz. (20 teaspoons) per gallon per 1,000 ft² spot application only (limited to an area no greater than 5000 ft²).
- Roundup = 6 oz. (12 tablespoons) per 1 gallon.
- Lontrel = 1/8 to 1/5 oz. per gallon per 1,000 ft²; spot application only to clumps of clover or individual dandelions.

5.3.6 Weed control will be accomplished by mechanical methods only. In the event all practical mechanical methods fail to produce sufficient weed control, the golf course superintendent may apply approved herbicides in the form of 2,4-D (Weed-B-Gon), glyphosate (Roundup) and Lontrel to maintained, fertilized fairway and tee areas only. At no time shall any herbicide be applied to any green or rough areas, any unfertilized play areas, any natural vegetation or wetland and surface water area. The golf course operator shall check National Weather Service projected weather forecasts (916-442-1468) prior to use of pesticides. If adverse weather conditions are anticipated within five days of application, use of the pesticide shall be postponed. Adverse weather conditions would include a forecast predicting precipitation in excess of a trace amount with a probability of occurrence exceeding 10%. The golf course superintendent must be notified if a weed infestation is observed. Herbicides can only be applied with the full knowledge of the golf course superintendent.

5.3.7 Weed-B-Gon, Roundup or Lontrel application areas shall be as limited as possible to complete the task. Individual or "spot" application area should not exceed 5000 ft².

5.3.8 Weed-B-Gon, Roundup or Lontrel shall be applied using a hand-held applicator equipped with a hand-trigger device. No fogger, aerial or hose end application is allowed.

5.3.9 Areas treated with Weed-B-Gon, Roundup or Lontrel shall be identified with markers at four points. No irrigation will be allowed on the treated area for at least 48 hours.

5.3.10 Records shall be kept on an ongoing basis of the use of herbicides and fungicides. The records will include entries with the following:

1. Herbicides/Fungicides:
 - a. Herbicides/Fungicides Purchased

* The use of any herbicide containing "2,4-D" will be voluntarily suspended for a period not exceeding 180 days from the date of approval of the CHAMP to allow the State of California a reasonable length of time to complete its review of Proposition 65 chemicals including 2,4-D.

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- (1) Each type of herbicide/fungicide purchased
- (2) Amount of each type of herbicide/fungicide purchased
- (3) Date of each purchase
- (4) Place of purchase
- (5) Date of onsite arrival of herbicides/fungicides purchased
- (6) Onsite storage location of herbicides/fungicides purchased

b. Herbicide/Fungicide Application

- (1) Types of herbicide/fungicide applied
- (2) Locations of application
- (3) Dates of application
- (4) Amounts of application
- (5) Method of application
- (6) Name of person(s) responsible for application

5.3.11 All herbicides/fungicides which arrive at the project site shall not be stockpiled onsite for any longer than a period of 30 days.

Herbicides/fungicides stockpiled onsite shall be removed from the project site after 30 days and the following shall be reported:

1. Type of herbicide/fungicide removed from the project site
2. Amount of herbicide/fungicide removed from the project site
3. Location of herbicide/fungicide disposal

5.3.12 At no time shall maintenance personnel transport and/or distribution vehicles contain active fungicide ingredients in excess of 25 pounds (11.3 kilograms) of chloroneb (as found in Fungicide II).

5.3.13 At no time shall maintenance personnel transport herbicide application mixtures (as described in 5.3.5) in excess of:

- **2,4-D and MCPP (as found in Weed-B-Gon) prescribed application mixtures in the amount of 10 gallons (37.5 liters).**
- **Glyphosate (as found in Roundup) prescribed application mixtures in the amount of 10 gallons (37.5 liters).**
- **Clopyralid (as found in Lontrel) prescribed application mixtures in the amount of 10 gallons (37.5 liters).**

5.3.14 All herbicides shall be applied in liquid form only. The “weed and feed” type granular products should not be applied.

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5.3.15 Weed control will utilize mechanical methods only. In the event that all practical mechanical methods fail to provide sufficient weed control, the golf course superintendent may apply Weed-B-Gon or Lontrel to the infested area as directed by the CHAMP. If such application is necessary, the drainage from the treated area will be isolated from the surrounding environment. This isolation process should be in effect for a minimum of three days after herbicide application or until no potential drainage water remains. There is a potential for summer thundershowers to mobilize Weed-B-Gon and Lontrel shortly after application. To minimize the potential for Weed-B-Gon or Lontrel to impact the surrounding surface water, all drainages into and away from the treated area should be blocked. We envision this could be accomplished using sand bags to block the drainage and adequately sized sump pumps to divert upslope runoff and recirculate runoff from the treated area. The golf course superintendent should be consulted in the event of precipitation.

5.4 Fertilizers

5.4.1 Fertilizers are considered as any substance, either chemically processed or natural organic matter, that is applied to enhance and enrich the growth of the golf course turf.

5.4.2 Only approved fertilizers listed in the "Golf Course Maintenance Proposal" provided in Addendum XII shall be used on the golf course. The list includes the following:

- Scotts Starter 19-26-5 or equivalent
- Scotts High Density 22-0-16 or equivalent
- Scotts Super Greens Fertilizer 19-0-17 or equivalent
- Scotts H.D. Nitrogen Plus 31-0-0 or equivalent
- Scotts Turf Fertilizer w/SREF 34-3-7 or equivalent
- Scotts High K Fertilizer 15-0-30 or equivalent
- Isobutylidene Diurea (IBDU)
- NatureSafe
- Sustane (Natural Organic and Natural Base)

Other fertilizer type products approved for use are:

- Ferrous Sulfate (FeSO_4)
- Potassium Sulfate (1(2504)
- Gypsum, Calcium Sulfate (CaSO_4)
- Dolomite Limestone

5.4.3 All fertilizer applications shall be documented on forms available from the superintendent.

The records shall reflect the following:

1. Locations of applications
2. Type of fertilizer applied

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3. Amounts of applications
 - a. Total pounds
 - b. Pounds per acre
4. Dates of application
5. Composition of the fertilizer

5.4.4 The application of fertilizers to areas of natural vegetation between the golf course tees, fairways, and green islands is prohibited throughout the golf course.

5.4.5 Fertilizers shall only be applied to maintained, groomed turf areas, tees and green islands.

5.4.6 All fertilizing will be done with the full approval and knowledge of the golf course superintendent.

5.4.7 The greens should be fertilized in increments of not more than 0.25 pounds of nitrogen per 1,000 square feet per application. Total yearly nitrogen application shall not exceed 3.5 pounds of nitrogen per 1,000 square feet per year.

5.4.8 The fairways are to be fertilized not more than three times per season with not more than 0.7 pounds of nitrogen per 1,000 square feet per application.*

5.4.9 The tees are to be fertilized not more than once per month at a rate of 0.5 pounds of nitrogen per 1,000 square feet per application.*

5.4.10 All fertilizer shall be of a granular, slow release form and distributed using mechanical spreader equipment for even application.

5.4.11 All fertilizer applications shall be documented on forms available from the superintendent.

5.4.12 Fertilizer shall not be applied within 25 feet of Squaw Creek or any other perennial streams or water bodies (Placer County Conditions of Approval No. 104).

5.4.13 At no time shall fertilizers be applied to areas with standing water.

*The actual amount of fertilizer applied can be calculated from its nitrogen content. For example, a fertilizer with 19-0-17 (N-P-K) contains 19 percent available nitrogen by weight. Applying 0.7 pounds of N per 1,000 square feet would require 3.68 pounds of fertilizer.

$$\frac{0.7 \text{ pounds N}}{19 \text{ pounds N} / 100 \text{ pounds fertilizer}} = 3.68 \text{ pounds of fertilizer per 1,000 square feet}$$

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5.4.14 As specified by the Lahontan Board Order, the information on fertilization as contained in "Golf Course Maintenance Proposal" prepared by John Stanowski, shall be implemented.

Portions of the information referenced above is reprinted below.

"I. Fertilizer and Cultural Strategy

The following report is a recommendation to the Perini Land and Development Co. for use as a guide in the maintenance of a golf course in a Sierra meadowland environment.

The strategy being proposed, is decidedly a "lean and mean" approach. This is a philosophy based on scientific information, that turf is actually healthier when it is not fed as much nitrogen or watered as much as previously thought necessary. In combination with natural buffer zones and collection ponds to recycle irrigation water, the goal is to affect no degradation to the environment. Excessive nitrogen leads to disease susceptibility, depleted root structures and poor wear tolerance as well as to other stress factors such as heat, drought and cold. With the higher use of potassium instead we intend to strive for deeper and dense root structures and thicker more resilient cell walls of the vegetative portion of the turf. The turf may be less colorful although the use of iron will help provide the color that is lost.

5.4.15 Applications of fertilizer shall not begin until soil temperatures exceed 45 degrees (F) for three consecutive days. Fertilizer applications must end when soil temperatures remain below 45 degrees for more than three consecutive days (Placer County Conditions of Approval No. 104). Temperatures shall be read with a stainless steel stem thermometer at a depth of 4 to 6 inches.

5.4.16 Any fairway, tee or green areas that require repair or revegetation due to winter freeze, disease or other complete damage, and will require an additional fertilizer application to recover growth must first be approved by the Lahontan Executive Officer of the LRWQCB. In any case, not more than six pounds of Nitrogen per 1,000 square foot should be allowed and only until the damaged area is recovered.

5.4.17 Any proposed change in the amount or type of fertilizer to be used shall be reported to the Lahontan Regional Board and the TRC at least 10 days in advance of implementation of any such proposal.

5.4.18 When feasible, new sod should be used to replace damaged areas as described in Section 5.4.17.

5.5 Irrigation

5.5.1 Direct irrigation of endemic flora (natural vegetation) will not be allowed. This will minimize the impact on natural vegetation and wildlife.

5.5.2 The maximum irrigation rate will be 1.5 inches per week, and may be reduced during the growth season as geographic locations, climactic trends, and turf requirements dictate. Any change from this irrigation rate will require the approval of Lahontan RWQCB.

5.5.3 The irrigation system shall maximize the even distribution of water to all irrigated areas. No area should exceed the maximum application rate by more than 15 percent.

5.5.4 All irrigation practices shall be conducted in accordance with the "Golf Course Maintenance Proposal" report provided in Volume III, Addendum XII. Specifically:

"Irrigation can help in the stabilization of newly graded soils. Light, frequent cycles help prevent wind erosion and serve to settle the soil. During seeding establishment, light, frequent cycles are necessary throughout the day to insure germination. Plant root structures are immature and deep watering is of no use. After the turf is established and then when the course opens, mid-day waterings give way to nightly cycles. Once again using repeat cycles will reduce run-off. Deeper penetration will be achieved in this manner to aid in root elongation.

Any irrigation system for this project will certainly have multiple repeat capacity. Many have the capacity for a daily percentage addition or reduction of total watering time based on daily fluctuations in the evapotranspiration rate. The superintendent can adjust according to his assessment or by the use of soil tensiometers and evaporation pans.

An average nightly watering in this area during peak periods would be about 16 minutes. Some runoff will likely occur unless this is done for example, in four cycles of four minutes each. Soil and thatch are very often hydrophobic at first and initial wetting makes subsequent watering more effective."

Any variation from the routine irrigation methods shall be brought to the attention of the golf course superintendent.

5.6 Drainage System Maintenance

5.6.1 Course management shall follow the practices outlined in Board Order No. 6-87-102 which states:

Best Management Practices

1. There shall be no removal of vegetation nor disturbance of existing soil conditions except where adequate erosion control and storm water runoff control facilities are installed and operational.
2. Adequate erosion control and storm water runoff control facilities shall be installed, operated, and maintained to manage discharges from areas where existing ground surface conditions have been disturbed.
3. There shall be no removal of vegetation nor disturbance of existing ground surface conditions between October 15 of any year and May 1 of the following year.
4. The discharge of surplus waste earthen material to drainage ways is prohibited.
5. The placement of waste earthen materials in such a manner as to allow the discharge of such materials to adjacent undisturbed land areas or to any surface water is prohibited.
6. There shall be no significant modification of existing drainage ways or existing stream channel geometry except for the purpose of stabilization or enhancement of water quality improvement effects. All modifications of the bed, channel, or bank of a stream require a prior written agreement with the California Department of Fish and Game.
7. Disturbed areas shall be adequately restabilized or revegetated. Revegetated areas shall be continually maintained until vegetation becomes established.
8. Surface flows from the project site shall be controlled so as to not cause downstream erosion at any point.
9. All restabilization and revegetation measures on disturbed areas shall be completed prior to October 15 of each year.
10. All surplus waste earthen materials shall be removed from the project site and deposited only at a legal point of disposal or adequately restabilized onsite.
11. Storm water runoff handling and disposal facilities shall be periodically cleaned and renovated.
12. Any water from dewatering activities shall be discharged to a containment facility or area of adequate size to preclude a discharge to surface water.

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5.6.2 An inspection of the project shall be made by the operator on a monthly basis during those months in which ground cover by snow is not complete. Copies of the attached inspection form shall be used during the inspection. Only employees designated by the golf course superintendent shall perform the inspections. The completed inspection forms shall be maintained in a file by the golf course superintendent.

5.6.3 All drainage collection and installed treatment systems shall be inspected weekly during the irrigation season and every other week during the off season. The systems will be inspected for leaks, sediment buildup, clogging, and algae growth. The golf course superintendent shall be notified immediately of any deficiencies. The attached inspection form shall be used during the inspection. Only employees designated by the golf course superintendent shall perform the inspections. The completed inspection forms shall be maintained in a file by the golf course superintendent. It is essential that these systems remain in proper operating condition at all times to prevent unauthorized discharges.

Table 2. Carbon Treatment Weekly Inspection Sheet

Hole #	Leaks	Algae Growth	Sediment Buildup	Clogging
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				

“+” no maintenance needed

“o” indicates maintenance needed before end of season

“-“ indicates immediate maintenance required

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5.6.4 The irrigation system shall be inspected prior to use of any fungicide or herbicide to assure the system will not irrigate the treated areas.

5.6.5 An ongoing program of rodent control using mechanical methods will be implemented by the golf course operator. The program shall keep the course relatively free of vertebrate pests such as gophers, ground squirrels, moles, etc., and shall maintain control programs for insects, fungi, and weed pests. The golf course superintendent shall be notified of any infestations.

5.6.6 No chemical additives will be used to clean or maintain any portion of any drainage collection or water treatment system. All maintenance of the drainage system must be conducted with mechanical methods.

5.6.7 At least three times per year, the discharge from three representative greens shall be sampled during the spring melt/runoff season. The samples shall be taken from the discharge of the carbon treatment units, and should be analyzed for chloroneb, nitrate as N, total nitrogen, pH and specific conductance. Analysis of total organic compound (TOC) may be substituted for chloroneb analysis once a correlation between the two has been established. Samples shall be collected by a person with at least two years of water quality experience. Samples will be taken to a California certified laboratory for analysis. The analytical results should be submitted to the golf course operator and permanently kept on file.

5.6.8 Not less than once a year, management shall have nutrient and fungicide testing performed on at least three representative greens, tees, and fairways as a means of providing guidance for the fertilization and fungicide program. Results of the testing shall be submitted to the golf course superintendent and permanently maintained on file. Fungicide (chloroneb) testing will be performed three times a year and will involve soil plugs from greens only. Analysis may be of total organic carbon (TOC) rather than chloroneb once a correlation is established.

5.6.9 Should fungicide or herbicide of testing greens show elevated levels of chloroneb, 2,4-D or glyphosate, application levels will be reduced in an amount sufficient to offset the residual amounts of these compounds.

5.6.10 The snow pack overlying greens, fairways and tees shall be managed to minimize the need for fungicides or herbicides during the growing season and reduce snow melt infiltration.

5.6.11 Basket devices for catching grass clippings shall be used on mowers except for the first mowing after a green has been top dressed or fertilized. All clippings, except areas that are not fertilized, will be disposed of offsite at an approved disposal facility. To the extent possible, fertilized clippings should not be allowed to enter any surface water body.

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5.6.12 Where maintenance tasks are specified to be performed on a scheduled basis (i.e. daily, every other day, etc.) management will not be expected to perform the task on the specified schedule if the performance of the task is precluded by weather or other unforeseeable or adverse conditions. The tasks shall be performed on the next available day on which weather or other conditions will not interfere with the reasonable performance of the task.

5.6.13 The project site shall be checked daily for fungus growth, insect infestations, weed invasion or any other pest problem. The appropriate mechanical controls for these conditions shall be applied as soon as necessary after their detection.

5.6.14 Pest control in rough areas will use mechanical methods only.

5.6.15 Pest control in sand trap areas will use mechanical methods only. When sand traps are constructed with underdrains, then herbicide shall not be applied within 10 feet of those sand traps.

5.7 Chemical Spill Contingency Plan

This section is provided as a guideline for necessary actions immediately following an accidental spill or discharge of chemicals. It is impossible to provide spill contingency plans for every conceivable accident scenario, therefore, the guidelines provided should be implemented as preliminary spill control measures after notifying the superintendent, but prior to receiving directions from Placer County Division of Environmental Health (DOEH), Lahontan (RWQCB), and the Technical Review Committee (TRC).

5.7.1 Immediately notify the Placer County Division of Environmental Health, the TRC and Lahontan RWQCB of any spill, regardless of the size of spill, date, time, day of week or location. The notification phone numbers for these agencies are:

Placer County Division of Environmental Health
(916) 581-6240*

Lahontan Regional Water Quality Control Board
(916) 544-3481*

*After hours messages can be recorded at each location on an automatic answering machine.

These phone numbers shall be posted near the spill response equipment (see Section 5.7.2)

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5.7.2 Spill response equipment shall be assembled and maintained near the chemical storage facility for cleaning up any chemical spills. The equipment shall be readily accessible. The equipment shall not be used for any purpose except for chemical spill cleanup. The equipment shall include at least the following:

1. Approximately 100 sandbags for directing sheet flow.
2. A portable pump and generator for removal and/or recycling of contaminated fluids.
3. Storage containers sufficient to contain approximately 500 gallons of either solid or liquid.
4. Several brooms and shovels.
5. Industrial-type vacuum of sufficient power to retrieve spilled solids and liquids.
6. Approximately 10,000 square feet of visqueen to cover areas where herbicides have been applied.
7. Approximately 50 pounds of chemical absorbent to contain liquids.

5.7.3 The golf course superintendent shall immediately be notified of any adverse condition. An adverse condition shall include, but not be limited to, any herbicide or fungicide spills; losses or thefts of herbicides/fungicides; excessive application of herbicides/fungicides; or any unauthorized uses of herbicides/fungicides. The Regional Board shall also be notified whenever adverse weather conditions occur within fifteen days following the application of any herbicide, especially Weed-B-Gon. A written report shall follow detailing the reasons for the adverse condition and procedures to alleviate the adverse condition.

5.7.4 If the spill consists of a solid on land, the material should be immediately collected by sweeping, shoveling or using suction type cleanup equipment. The collected material may be reused or disposed of offsite.

5.7.5 Should the spill of a solid material enter surface water of any kind, every effort should be made to immediately remove the material from the water and place it into a suitable container. Small surface water flows should be immediately blocked downstream and diverted upstream around the spill site. The recovered spill materials should be transported to and stored in the chemical holding area pending further instructions from Placer County DOEH and/or Lahontan RWQCB and/or TRC. If a chemical spill (liquid or solid) enters a large surface water body, the appropriate agencies identified in Section 5.7.1 should be immediately notified. The water body shall then be sampled immediately

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downstream of the spill area within one hour from the time of the spill. The sample shall be submitted to the superintendent or next person in charge and should be analyzed for parameters identified by the contacted agencies. If the discharge (spill) to the surface water continues, daily samples shall be collected until the discharge ceases.

5.7.6 If the spill is a liquid on land, immediately isolate the spill by berming the affected areas with sand bags or soil. Immediately apply chemical absorbent. Every effort should be made to keep the affected area dry. Do not apply water to the spill area. If necessary, cover the affected area with visqueen or other suitable water repellent material. When possible, the spilled liquid or solid should be collected using a portable, high-suction industrial-type vacuum. When a liquid spill occurs on soil and/or turf area, that area should be identified immediately. The soils may be aerated or removed if the size of the area is manageable. Further action will be directed by Placer County DOEH, Lahontan RWQCB, and the TRC.

5.7.7 A remedial ground water investigation should be commenced within 72 hours of a large liquid spill as determined by Lahontan RWQCB. Remedial activities should commence within ten days of the spill. Remedial action could conceivably consist of extraction well points downgradient of the spill. The water obtained in this method could be stored in portable tanks. Final treatment could be accomplished onsite or offsite whichever is most cost effective.

5.7.8 All circumstances leading up to the spill, action immediately following the detection of the spill, notification procedures, all cleanup activities and waste disposal activities shall be carefully documented and presented to Lahontan RWQCB, the TRC, and Placer County DOEH.

ATTACHMENT 2

GENERAL PROVISIONS FOR MONITORING AND REPORTING

SAMPLING AND ANALYSIS

1. All analyses shall be performed in accordance with the current edition of Standard Methods for the Examination of Water and Wastewater, in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Executive Officer.
2. The Discharger shall establish chain-of-custody procedures to assure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. These procedures shall be submitted to the Executive Officer in writing within 30 days of initial sample collection.
3. Effluent samples shall be taken downstream of any addition to the treatment works and prior to mixing with the receiving waters.
4. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to insure accuracy of measurements, or shall ensure that both activities will be conducted.
5. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
6. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

REPORTING

1. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.
 2. The Discharger shall maintain all sampling and analytical results, including: strip charts; date, exact place, and time of sampling; what analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Board.
-

3. Monitoring reports shall be signed by:
 - a) In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
 - b) In the case of a partnership, by a general partner;
 - c) In the case of a sole proprietorship, by the proprietor;
 - d) In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

4. Monitoring reports are to include the following:
 - a) Name and telephone number of individual who can answer questions about the report.
 - b) The Monitoring and Reporting Program Number.
 - c) Identification of individual collecting the samples.
 - d) Name address and telephone number of laboratory performing the analysis
 - e) The facility's eleven digit WDID number

ATTACHMENT 3

SAMPLING AND ANALYSIS REQUIREMENTS

NUMERIC TARGET MONITORING

**SQUAW CREEK TOTAL MAXIMUM DAILY LOAD FOR SEDIMENT,
PLACER COUNTY**



**Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, California 96150
530.542.5400**

Contact Person:

Anne Holden
Engineering Geologist
aholden@waterboards.ca.gov
530.542.5450

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1. DATA COLLECTION SUMMARY

The following shall be collected synoptically (i.e., at the same time) at each site, and on a biennial schedule (i.e., once every two years):

- General sampling site information (date, time, weather, conditions)
- Global Positioning System (GPS) coordinates of site locations
- Site photographs
- Water chemistry data
 - Temperature, dissolved oxygen, pH, conductivity
- Physical habitat data
 - Substrate particle size, water depth, stream width, current velocity
- Benthic macroinvertebrate samples

2. SAMPLING LOGISTICS

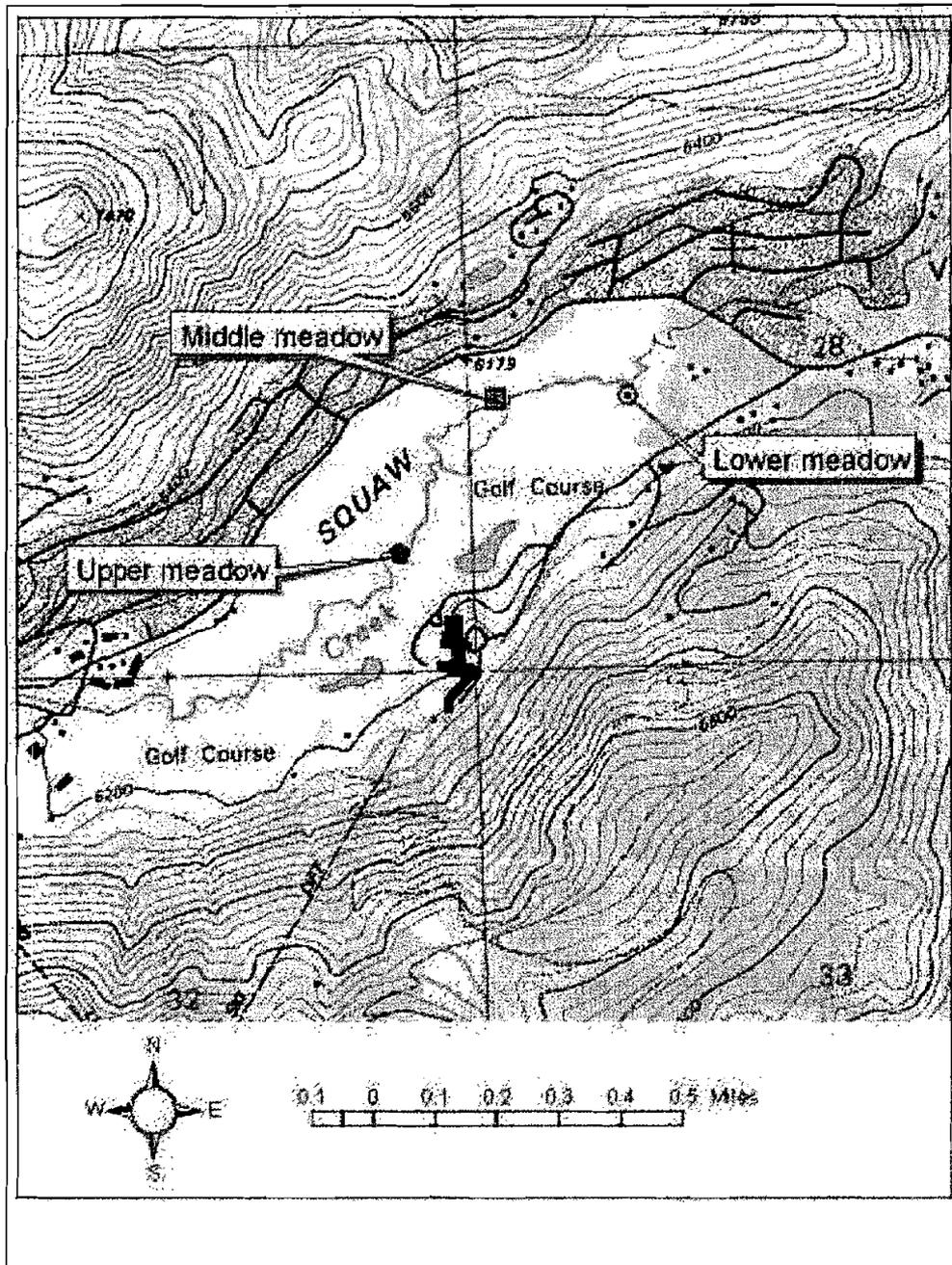
Sample Locations

Bioassessment sampling locations shall duplicate the three sites in the low gradient meadow reach of Squaw Creek sampled in 2000 and 2001 for the Squaw Creek TMDL bioassessment study (Herbst 2002). The UTM coordinates (datum: NAD 1927) for each site established by Herbst are provided in Table 1. The coordinates were recorded at the downstream end of each 150-meter sampling reach. Figure 1 shows the general sampling site locations.

Table 1. Sampling site coordinates. Datum is NAD 1927.

Location	Northing	Easting
Squaw Creek Upper meadow	4342814	740091
Squaw Creek Middle meadow	4343185	740287
Squaw Creek Lower meadow	4343245	740475

Figure 1: Squaw Creek meadow reach numeric target monitoring locations



Sampling Frequency

Sampling shall be conducted once every two years, beginning in 2009.

Sampling Period (also called “Index Period”)

Sampling shall occur between the months of June and August, after peak snowmelt flows have subsided, when flows in the meadow reach are continuous and riffle habitat at the sampling sites is present. Target flow conditions are when the high-discharge snowmelt period is over, but before baseflows become so low that no riffle habitat is present. Avoid sampling when flow may be strongly influenced by precipitation, because sudden flow increases may affect local community composition (SWAMP 2007).

Sampling Equipment

(Adapted from Herbst 2001 and 2002, and SWAMP 2007)

- Multi-parameter probe or individual probes (for field measurements of dissolved oxygen, temperature, conductivity, pH)
- Current meter (for stream discharge)
- D-frame kick net (250-micron mesh size)
- BioQuip forceps
- White sorting pan (enamel or plastic)
- 100% ethanol and rose bengal stain
- Sample jars (250 ml or 500 ml)
- Buckets (2) and aquarium nets (fine mesh)
- Meter stick or other graduated rod (for measuring depth and pebble counts)
- Meter tape (50 meters on a reel)
- Data collection sheets/fieldbook
- Flags/flagging Tape
- Camera
- GPS unit
- Small metric ruler or gravelometer for substrate measurements

3. FIELD PROCEDURES

(Adapted from Herbst 2001 and 2002, and SWAMP 2007)

Prepare Sampling Location

1. Define sampling reach

Each sampling site is a 150-meter reach along an approximation of the thalweg (i.e., deepest part) of the channel. To the extent possible, this measurement should be made by following along the bank contours of the channel, laying out the meter tape. This may require crossing the channel or even walking in the stream if bank vegetation cover is too dense – but this should be avoided or kept to an absolute minimum to avoid

disturbance of benthic habitat. Lay out the 150-meter reach starting at zero at downstream end of reach.

2. Record reach information

Once the 150-meter reach is delineated, record GPS UTM coordinates and datum at the bottom end of the reach. Record date, time, sampling staff, site name (i.e., Squaw Creek upper, middle or lower meadow) and general weather conditions, as well as any other conditions that may influence bioassessment sampling (i.e., recent high flows, scouring events, other stream disturbances, etc.).

3. Take photographs

Photos shall be taken at 0 meters (m) looking upstream, 50 m looking upstream, 100 m looking upstream and 150 m looking downstream. For all photos, record site, date, and transect location of photo (e.g., 0 m looking upstream).

4. Define riffle-pool areas

Over the 150-meter reach, record along the meter tape (to the nearest meter) where erosional and depositional habitat types begin and end – riffles and pools, respectively. This provides an indication of the distribution and length of these major geomorphic features within each reach. The position of these habitat features shall also be used to determine where the benthic invertebrate samples are to be collected by using a random number table (0-150). Specifically, after recording the riffle ranges, select random numbers until five of the random numbers correspond with the riffle ranges, and then sample at those locations. Any habitat not assigned to the riffle-pool categories may be recorded as transitional “glide” or “run” habitat type.

5. Establish transects

Establish fifteen transects, spaced at 10-meter intervals, over the length of the 150-meter sampling reach. Mark transects with surveyor's flags or similar, along a single bank.

Measure and Record Water Chemistry Data

At the top end of the reach, where no instream habitat has been disturbed by the sampling crew, measure and record ambient water chemistry data (i.e., pH, dissolved oxygen, temperature, conductivity).

Collect Benthic Macroinvertebrate Samples

Macroinvertebrate samples shall be collected before recording physical habitat data. Samples shall be collected as composites of 3 kick samples across 5 randomly selected

riffle habitats; therefore, each sampling site will have 5 replicate samples collected for laboratory analyses.

Benthic Macroinvertebrate Sampling Procedure

(Adapted from Herbst 2001, Appendix 2-2)

Select 5 riffles from a random number table (as described above in the subsection titled "Define riffle-pool areas") along the 150-meter reach. Use the D-framed net (250-micron mesh size) to collect kick samples at $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ of the stream width. (Always start at the location furthest downstream and work up.) When selected riffles are wide enough, collect the 3 samples for each composite along a transect that is perpendicular to the stream (i.e., across the stream in a side-by-side manner). For selected riffles that are too narrow to collect all 3 samples along a perpendicular transect, collect the 3 samples one above the other (starting from downstream) as described further, below. Kick an area approximately 30 x 30 cm directly upstream of the net (a square area with sides equal to net width). Continue this kick for about 10-15 seconds, then rub the rocks by hand for an additional 10-15 seconds (total 20-30 seconds at each of 3 positions = 1 to 1.5 minutes). If shallow enough, just use hands for the full time, rather than kicking. After each sample position, remove large rocks or wood debris after washing them in the current into the net.

For streams less than 1-2 meters wide, take 2 kick samples from both sides of the stream with one sample just above and mid-stream, or collect all 3 samples singly (one above another) starting at the random number location (instead of taking all 3 across the stream when widths are greater than 1- 2 meters). Keep in mind that the goal is to sample across different microhabitat types in the stream including varied depth, current, and substrate types; the three composited samples should represent the variety of riffle habitat present. One or two samples may be used to comprise a composite if samples are dense with debris. The label should then indicate the number of kicks used (i.e., 1 or 2); assume 3 if not noted on label. If riffle habitat is not available across the entire line of each transect, select representative locations to collect the needed composite sample.

Quickly dip the net into the stream to consolidate the material to the bottom of the D-framed net. Pick out any remaining large debris being sure to retain any attached insects. Invert the net into a bucket that is $\frac{1}{4}$ to $\frac{1}{3}$ full of water. Shake out the net to collect all the debris and insects (do not dip in bucket water since insects will adhere). Dip net into the stream again to consolidate remaining contents and flick inverted net into the bucket.

Elutriate (pour off lighter material) with a swirling motion into the other bucket five times. Use only a small volume of water in each elutriation so the receiving bucket does not overflow. Only rocks and sand should be left in the original bucket. Empty these rocks into a shallow white pan (or closely examine the bottom of the bucket). Search for cased caddisflies/snails and add to sample if found (they are heavier and may not pour off).

Strain collected material through a fine mesh aquarium net supported on one bucket (this may also serve as elutriation since some sand usually remains). Empty contents of aquarium net into a sample container. Use BioQuip forceps to scrape any remaining debris into vial. Fill container with ethanol to preserve the captured organisms. Fill to a level that just covers the amount of debris. Add 5 ml of rose bengal stain. Label sample jar as shown below, and move on to next sample.

Label Sample Jars

Record stream name, site name, date, and replicate number. The label shall also indicate the number of kicks used (i.e., 1 or 2) if fewer than 3; assume 3 if not noted on label.

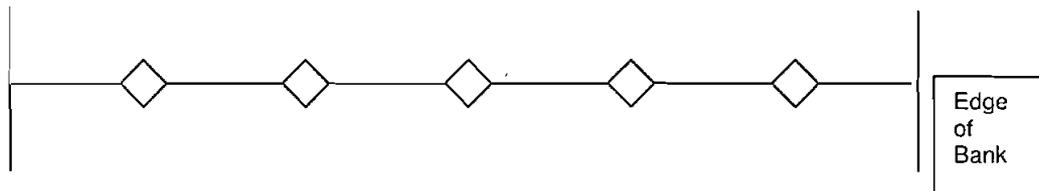
Collect Physical Habitat Data: Percent Fines and Sand, D-50 Particle Size

(From Herbst 2001 and 2002, and SWAMP 2007)

Physical habitat data shall be collected at 5 equidistant points along each of the 15 established transects. Current velocity shall be measured at one selected representative transect at each reach.

1. Measure and record stream width (wetted perimeter) at transect location. Each transect is then visually divided into 5 equally spaced points (visualize the mid-point as 3, and equally divide the left and right sides into points 1 and 2 and points 4 and 5). (Figure 2).

Figure 2. Spacing of transect points.



2. At each of the 5 points along the transect, lower a graduated rod (e.g., meter stick or similar) through the water column perpendicular to both the flow and the transect to objectively select the particle located at the tip of the rod.

3. Measure the depth from the water surface to the top of the particle and record to the nearest centimeter.

4. Remove the particle from the streambed, then measure and record the length of its intermediate axis to the nearest millimeter, and assign to one of the size classes listed below. Alternatively, size may be estimated using descriptions listed below (SWAMP 2007). Record size class using codes listed in the far right column of Table 2.

Table 2. Substrate size descriptions and size class codes.

Substrate	Size (Herbst 2002)	Description (from SWAMP 2007)	Size Class Code
Fines	< 1 mm	Not gritty	F
Sand	1-3 mm	Gritty to ladybug	S
Gravel	3-65 mm (6.5 cm)	Ladybug to marble to tennis ball	G
Cobble	6.5 cm to 25 cm	Tennis ball to basketball	C
Boulder (or bedrock)	>25 cm (10 inches)	Bigger than basketball	B

5. Select one representative transect at each reach to record current velocity. At 60 percent depth, measure the current velocity at each point along the selected transect. Record current meter type used and units. Discharge is calculated as the sum of one-fifth the stream width times the depth and current velocity measured at each of the five transect points.

Stream velocity, depth, and substrate size shall be recorded and reported using the template provided in Attachment 1 (from Herbst 2001, Appendix 1-7, pp. 2-3), or an equivalent method, and stream discharge (width x depth x velocity) shall be reported for each reach. Substrate data shall be entered into the Excel spreadsheet template provided in Attachment 2, and provided to Water Board staff in that electronic format, including values for the D-50 (median) particle size and "percent fines plus sand" calculated for each reach according to the methods and formulas in Attachment 2.

4. LABORATORY ANALYSIS

Standard Operating Procedures for Laboratory Processing and Identification of Benthic Macroinvertebrate Samples

(Adapted from Herbst 2001 and 2002)

Subsample Counts:

Each subsample shall have a minimum organism count of 250. Complete counts shall be performed for any and all subsamples taken. (Average counts will be in the 300-500 range.)

Sample Splitting:

Samples may be split to acquire subsamples using either the grid-tray method or a rotating drum (i.e., Folsom) plankton splitter. Additional background information about the performance characteristics of these and other procedures is available in Herbst and Silldorff (2004).

Sample Identification:

Sorted specimens shall be identified, assigned, and reported using the taxonomic levels shown in Attachment 3 (Calculator for Squaw Cr Biological Targets). Each identification

shall have a taxonomic certainty rating of “1,” “2,” or “3” assigned to it, to assist in evaluating any problems with taxonomy that may arise (see taxa record sheets in Herbst 2001, Appendix 1-3, for an example template). Life stage(s) and observations of identifying traits or specimen condition shall also be recorded and reported along with the other results.

5. CALCULATION OF COMPONENT METRICS AND THE “BIOLOGICAL CONDITION SCORE” (BCS)

The BCS’s seven component metrics (i.e., Biotic Index, Taxa Richness, EPT Diversity Index, %EPT of Total, Number of Sensitive Taxa, % Tolerant Taxa, R-50 Index) shall be calculated using the methods in Attachment 3 (“Calculator for Squaw Cr Biological Targets”). Following calculation of the seven component metrics, the BCS shall be calculated by summing the component metric scores derived using the values in Attachment 3, (from: Herbst 2002, p. 9, table titled “Biological Condition Scores Assigned to Metric Value Ranges”).

6. QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

The discharger shall prepare and/or make available to its relevant staff and/or consultants a Quality Assurance Project Plan (QAPP) that addresses the required bioassessment monitoring. The QAPP should follow USEPA guidance and requirements as found in *USEPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5, EPA/240/B-01-003, March 2001), and *USEPA Guidance for Quality Assurance Project Plans* (EPA QA/G-5, EPA/240/R-02/009, December 2002). Upon request from the discharger, the Water Board’s Executive Officer or Quality Assurance Officer may override any USEPA quality assurance requirements and/or guidance that are deemed inapplicable and/or unnecessary for this project. Any such deviations must be approved in writing and in advance by Water Board staff. An umbrella document, such as a Quality Assurance Management Plan or other project or program quality assurance document, may be used to meet this requirement if the umbrella document covers all relevant aspects of the required bioassessment sampling.

The QAPP (or umbrella document) shall include, or be supplemented to include, a specific requirement for external quality assurance checks (i.e., verification of taxonomic identifications and correction of data where errors are identified). External QA checks shall be performed on: (1) all uncertain taxa; and (2) one macroinvertebrate sample per calendar year in which sampling occurs for this project, or ten percent of the samples per year (whichever is greater). QA samples shall be randomly selected. The external QA checks shall be paid for by the discharger, and performed by the California Department of Fish and Game’s Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used for the external QA checks if approved in advance by the Water Board’s QA Officer or Executive Officer.

7. DATA REPORTING

The discharger shall provide, within one year of each sample date, electronic copies (in Microsoft Excel[®] format) of:

- Spreadsheet with substrate size calculation formulas, providing values for the D-50 particle size and “percent fines plus sand”, calculated according to the methods and formulas contained in Attachment 2. (This reporting requirement can be satisfied by completing and submitting the spreadsheet provided in Attachment 2.)
- All raw bioassessment data (i.e., all data for all 5 replicates for each site) in spreadsheet format, reported using the taxonomic levels in Attachment 3. (Note: Deviation from the taxonomic levels in Attachment 3 is not acceptable, since any such deviation could affect the component metrics and final BCS score.) This shall include a separate column of data for each of the five replicates, and a “total” column that sums (composites) the data for all five replicates. (This reporting requirement can be satisfied by completing and submitting the spreadsheet provided in Attachment 3.)
- Metric calculation spreadsheet showing values for the seven BCS component metrics and the final BCS score calculated according to the formulas in Attachment 3. (This reporting requirement can be satisfied by completing and submitting the spreadsheet provided in Attachment 3.)

The discharger shall also provide, concurrently with the data described above, in both hardcopy and electronic (i.e., Adobe PDF) formats, a brief interpretive report including:

- A narrative summary of the results (including calculated Biological Condition Score, D-50 particle size, and “percent fines plus sand”) for each site and date, with a tabular comparison of the most recent scores to the TMDL targets and any and all previous monitoring scores (i.e., to clearly display and briefly summarize the trends in target values over time compared to the numeric targets).
- Photocopies of field data sheets and field notes
- Site photographs
- Results of the external QA checks and any action(s) taken to resolve any discrepancies encountered during the QA process.

8. SAMPLE PRESERVATION AND ARCHIVING

Definitions: The “original sample material” is that material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification. The “remaining subsampled material” is that material (i.e., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but this needs to be verified via QA

completeness checks, according to the lab's QAPP.) The "identified organisms" are those organisms within the subsample that are specifically identified and counted.

The original sample material shall be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material shall be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms shall be stored in 70 percent ethanol, in separate glass vials for each of the five replicates for each site for each sample date. The discharger shall preserve and retain these identified organisms until the Regional Board's Executive Officer accepts in writing the fifth biennial monitoring report (i.e., If monitoring commences in 2009, and is conducted every other year, in 2011, 2013, 2015, and 2017, the identified organisms shall be preserved and retained by the discharger as described above until the ten-year report on the 2017 results is accepted in writing by the Executive Officer).

The external QA samples shall be stored in 70 percent ethanol in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms shall be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, method of collection). These samples shall be transmitted to the external QA laboratory, and once returned by the external QA laboratory shall be archived (i.e., retained) by the discharger for the same duration as the other identified organisms.

All archived samples shall be checked at least once per year and "topped off" with ethanol to prevent desiccation, and shall be relinquished to the Water Board upon request by any Water Board staff.

9. ATTACHMENTS

1. *Appendix 1-7.pdf* from Herbst (2001), "Stream Form" (3 pages)
2. *D-50 calculation template.xls* (Excel spreadsheet template for calculating and reporting D-50 particle size and "percent fines plus sand")
3. *Squaw_permit_attachment_3_Calculator_for_Squaw_Cr_Biological_Targets.xls* (Example Excel spreadsheet template for calculating individual component metrics of the Biological Condition Score)

10. REFERENCES

- Herbst, D.B. 2001. *Quality Assurance Project Plan – Aquatic invertebrate bioassessment monitoring in the Eastern Sierra Nevada*, Sierra Nevada Aquatic Research Laboratory and Lahontan Regional Water Quality Control Board. Download at: http://www.waterboards.ca.gov/lahontan/water_issues/projects/quality_assurance_project_plan/index.shtml
- Herbst, D.B. 2002. *Development of Biological Water Quality Targets for Assessment of Total Maximum Daily Load (TMDL) of Sediment in the Squaw Creek Watershed (Placer County, California)*. Final Report to Lahontan Regional Water Quality Control Board for Contract #9-118-160-0. April 16, 2002. 39 pp. Download at: http://www.waterboards.ca.gov/lahontan/water_issues/programs/swamp/docs/herbst_scb_2002.pdf.
- Herbst, D.B., and E.L. Silldorff. 2004. *Performance of Different Bioassessment Methods from California: Side-by-Side Comparisons of Field, Laboratory and Analysis Procedures for Streams of the Eastern Sierra Nevada*. Final Report to the Lahontan Regional Water Quality Control Board for Contract #9-191-160-0. November 26, 2004. 51 pp. Download at: http://www.waterboards.ca.gov/lahontan/water_issues/programs/swamp/docs/herbst_silldorff_methods_comparison_2004.pdf
- Surface Water Ambient Monitoring Program (SWAMP). 2007. *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*. California State Water Resources Control Board, Sacramento, CA. February 2007. 48pp. Download at: http://www.waterboards.ca.gov/swamp/docs/phab_sopr6.pdf