SURFACE WATER DIVERSION PLAN / AQUATIC SPECIES AVOIDANCE & EXCLUSION PLAN NEWHALL RANCH PROTOCOLS

Prepared for:

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Valencia, California

Prepared by:

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Ventura, CA

November 15, 2011

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1.1 PROJECT BACKGROUND

The Newhall Ranch Specific Plan area is located downstream of Interstate 5, to the Los Angeles/Ventura County Line. The project area includes the Santa Clara River and many of its tributaries within this area. The Santa Clara River provides relatively intact riparian habitat, recognized as ecologically sensitive by county, state, and federal agencies due to its support of several listed animal and plant species. The tributaries are generally void of aquatic habitat, providing minimal opportunity for fish. The Newhall Ranch Specific Plan development includes temporary river crossings, new bridges, and bank stabilization along portions of the river flood plain. Construction will directly impact the wetted channel of the Santa Clara River during bridge pier construction, stream diversions, temporary bridge crossings, construction dewatering, and during any other in-stream construction activity. These activities require implementation of avoidance and exclusion measures for several sensitive aquatic species. This report discusses fish and other aquatic species avoidance and exclusion activities that may be implemented during these activities. Integral to aquatic species protection is the protection of water quality. Therefore this plan also discusses required water quality protections and BMPs required during RMDP project implementation where impacts to aquatic habitats may occur.

Sensitive fish species (Unarmored threespine stickleback (UTS), arroyo chub, and Santa Ana sucker) may be present throughout the Santa Clara River reach where the projects may occur. Other sensitive aquatic species potentially present include southwestern pond turtle, arroyo toad, and two-striped garter snake. The relative abundance of these species is dependent upon the intensity of the preceding storm season, spring and summer low flow channels and water temperatures, and other factors. Fish can be expected to be present in the area in varying abundance. Therefore, avoidance and minimization measures may be required anywhere work is conducted in the wetted channels, marshes, and backwaters if fish are present. Other aquatic and semi-aquatic species benefit from the implementation of these and other avoidance and minimization measures for fish. This plan discusses measures for sensitive aquatic and semi-aquatic species potentially present in work areas of the Santa Clara River and its tributaries.

1.2 PLAN PURPOSE AND NEED

Mitigation of impacts to aquatic habitats potentially occupied by sensitive aquatic species is primarily accomplished through avoidance mitigation measures. These measures include surveys, construction activity scheduling, spanning of wetted channels with temporary bridges, and other feasible measures to avoid work within wetted portions of the channel. Where construction must impact wetted portions of the channel (eg., temporary bridge is not feasible due to span length, bridge pier location falls within or adjacent to the wetted channel, active channel flow is within the construction limits of bank stabilization, or dewatering is necessary due to excavation depths), it will be

necessary to divert the flows. Significant dewatering operations, if conducted in proximity to the active channel, may result in drawdown of the active channel, simulating a stream diversion. Because this is a possibility for projects along the wetted channel, dewatering is addressed as a stream diversion in this plan.

In addition, RMDP project activities in close proximity to surface waters must implement construction water quality BMPs. Mitigation measures related to protection of water quality also benefit aquatic species and their habitats.

This report establishes a framework for water diversion activities including avoidance and exclusion of fish species from the work area. Diversion of flow and other methods to ensure adequate fish passage and habitat during construction activities are also presented in this report. Mitigation and monitoring strategies are presented at the end of this report to guide future implementation of these avoidance and exclusion methods.

This section describes the methods proposed to avoid and exclude aquatic species from the project area.

2.1 REGULATORY BACKGROUND

Fish are often monitored and/or relocated within areas of streams that are subject to a variety of construction activities. The U. S. Fish and Wildlife Service (USFWS) requires that any work with UTS be conducted by biologists that have proper permits (i.e., Incidental Take Permit 10(a)(1)(A) covering handling live specimens of the endangered unarmored threespine stickleback). The USFWS or their approved agents will conduct any handling of unarmored threespine stickleback. The other sensitive fish and aquatic species potentially present are considered species of special concern by the California Department Fish and Game (CDFG), therefore, only biologist with appropriate collection and handling permits may perform exclusion activities.

2.2 PRECONSTRUCTION SURVEY

During the planning stages of a project, attention should be paid to the scheduling of work within wetted portions of the river. Short duration construction activities should be performed during late summer/fall. Longer term projects may have to begin immediately after heavy winter storms and continue until the next storm season. Fish and aquatic species avoidance and exclusion activities may differ during these periods. Surveys for the presence/absence and relative abundance of fish and aquatic species should be performed well in advance of construction to determine what, if any, seasonal restrictions may need to be adhered to.

Pre-construction surveys and/or work within the wetted channel should not occur during fish spawn periods if fish are present, or suspected of being present. If work is anticipated to occur near the spawning period, then baseline surveys should be conducted in advance of winter storms and immediately after the storm season to provide a baseline of relative abundance and habitat quality for exclusion plan implementation. Because water and air temperatures, base flows, and vegetative growth are all factors in determining when spawning may occur, surveying of suitable habitats within the proposed work area should be conducted several times thru early spring. Within 30 days of the actual beginning of work in the wetted channel, a preconstruction survey should be conducted to determine the presence/absence and relative abundance of the target species. Both the project footprint and at least 300 feet of stream upstream and downstream of the limits of the project footprint should be surveyed. The relative number of fish of each species present, their life stages, and the current condition of the habitat would be recorded. Other sensitive aquatic species observed during focused pre-construction surveys would be relocated from the project area prior to activities within the aquatic habitats by a biologist possessing appropriate state permits.

2.3 PRECONSTRUCTION DIVERSION PLANNING

If diversion of the stream is anticipated, the terrain should be examined well in advance of construction to determine feasible methods to modify the flow channel to avoid the construction area. Terrace areas with native vegetation should be sought after for potential locations of diversion channels. It may be necessary to consider river bed sandy areas with minimal vegetation as potentially suitable for creation of vegetated channel habitat. Or for short duration projects, these areas may be evaluated for lined temporary flow channels.

If groundwater dewatering is anticipated, then the proximity of such activities to stream flows should be assessed. The potential for dewatering to affect surface water elevations or to contribute to excessive stream bed or bank erosion needs to be assessed both at the extraction points and at the discharge locations. This requires evaluation of surface water-ground water interactions, relative water levels, expected rain fall, bed and bank soils, and availability of discharge spreading grounds in comparison to the extent of proposed dewatering (ie. depth of excavations requiring dewatering, size of project – isolated pier excavation versus linear bank stabilization project). Dewatering plans must also use these evaluations to ensure that any dewatering discharge flows do not create artificial channel habitat that could become occupied by sensitive aquatic species, which would be entirely dependent upon continued pumping. Another consideration at the discharge is very high flow conditions, potentially elevating water surfaces, overtopping channel banks, or causing excessive channel bed erosion. A less likely occurrence, but of equal importance, is the drawdown of the ground water table to such an extent that the surface flows in the wetted channel are diminished or, for very long duration dewatering projects, stress of adjacent riparian vegetation becomes evident.

In either case, it will be necessary to ensure adequate aquatic habitat remains for any fish present in the wetted channel. The surveys and site evaluations are critical to the proper planning of any physical stream diversion, such as ensuring proper channel gradient and substrate, vegetative cover, and channel sustainability. An evaluation of the potential for such conditions is needed during the diversion planning stage.

2.4 AVOIDANCE

Where feasible, projects will be implemented in a manner that avoids impacts to the wetted channel and/or occupied habitats. This could involve utilizing construction methods that avoid entry into the wetted channel (eg., some bridges can be built from either end out over the water body with all work done “in the air above” without actually getting into the water, soil stabilization methods where dewatering is not required, or using temporary bridges for equipment crossing). In some cases, work may be planned to start immediately after winter storms have scoured the river sufficiently to have removed aquatic vegetation thereby minimizing available habitat for fish, or at times when fish populations are diminished or absent from project areas.

Another avoidance measure is to avoid fish refuge areas along the river. Three locations have been identified that provide fairly unique opportunities for fish to escape the

seasonal high flows, while remaining within suitable habitat along the margin of the river. The primary location, which has repeatedly been verified as occupied by UTS, is the Refuge site located near the Magic Mountain Theme Park parking lot area, upstream of the Newhall Ranch project limits. Two other potentially suitable locations have been identified within the limits of the Newhall Ranch Project; the confluence of Middle Canyon Creek with the Santa Clara River, and the confluence of Potrero Canyon with the Santa Clara River. Both of these locations may provide wetted channel in the form of flood plain tributaries which are beyond the influences of the main channel flows. Construction activities within or near these areas should be carefully planned as to avoid periods where fish may be utilizing the areas to escape high flood flows or other occurrences on the river.

2.5 EXCLUSION OF FISH FROM THE PROJECT AREA

If work cannot be avoided in the wetted channel then fish and other aquatic species must be removed from, and kept out of, the construction limits. In such cases the wetted channel to be impacted within the project area must first be blocked off so no aquatic species can enter during construction. The work area and the wetted channel including 50 to 100 foot buffer zones upstream and downstream can be isolated with block nets. These nets are typically one-eighth inch mesh and four to six feet deep (3 millimeter [mm] mesh, 1.2 to 1.8 meters [m] deep) to prevent small fish from going through the net. In the early spring when only larger fish are expected, this net might be as large as one quarter inch. The length of the nets will be sufficient to cross the entire active channel with sufficient length at both ends to account for some increase in wetted perimeter that occurs upstream of block nets due to their slight to major damming of the stream flow. The nets will be well weighted, usually with at least a one-ounce weight every six inches (15.2 centimeters [cm]) along the bottom. In addition, rocks or other heavy objects can be placed to keep the net on the bottom in fast flowing sections or areas with irregular channel bed surfaces. The net is supported in the stream with strong stakes, often rebar, t-posts, or wooden stakes pushed or driven into the substrate.

Once block nets are implemented, they must be maintained free of debris. It is important to use stout stakes since the nets can fill with trash, leaves, and other vegetation, become clogged and the pressure of the impounded or backed-up water can quickly compromise the nets either by overtopping or by pushing water around the margins on either side. Therefore, the nets must be checked frequently and cleared of any accumulated material or debris. Block netting with 1/8-inch mesh netting is not feasible at flows with high velocities (i.e., higher than 2 to 3 feet per second [fps]). Block netting of the low flows of the Santa Clara River is feasible during most of the year. During the heavy storm season, block netting is not practicable.

After deployment of block nets, fish and other aquatic species are removed from the exclusion zone. Multiple monitors under the direction of authorized biologists will move throughout the zone to relocate all fish and sensitive aquatic species from the block net area. Fish relocation efforts will be concentrated in the morning to avoid the heat of the day. Relocation of collected individuals will be to appropriate habitats downstream or other suitable location nearby but outside the project area and beyond block nets. Such

activities can be accomplished in a few hours early in the day while the air and water are relatively cool and stress to the fish is minimized. Other aquatic species are not as sensitive to air and water temperatures and may be relocated without restriction to early hours of the day. Recovered aquatic life may be placed and transported in water-filled buckets to be released downstream of the work site. A minimum of three full channel sweeps should be conducted to remove aquatic organisms prior to commencement of dewatering._

Block netting may also be implemented at the confluence of dewatering discharge and the active wetted channel to prevent fish from occupying any temporary flow channels. Other means to preclude fish from entering a discharge channel may also be employed, such as a small drop structure or other physical barrier to fish movement upstream.

2.6 FISH PASSAGE

Any modifications to the stream would be expected to mimic the natural stream flow as much as possible. Provision of fish passage (small southern California native species, including UTS) is necessary to maintain continuity of the fish populations upstream and downstream of the project area.

As discussed in the planning of bypass channels, velocities no higher than 2 foot per second are necessary. Maintenance of fish passage through a diversion is required only if the area is to be affected for long periods of time, essentially more than one annual season. Excluding small fish from the project area and temporarily restricting movement is not assumed to significantly affect the population. Passage is mostly discussed for upstream movement since small fish can easily go downstream through even fast-flowing areas as long as appropriate receiving habitat is present a short distance downstream and no screens or high falls (more than a few inches or so) are present. Specifications of flow under and around crossings and other stream modifications usually contain several factors. Thus, for any area being considered for fish passage, the following requirements should be met:

1. The passage area should be equal or greater in width than the width of the active channel bed (to maintain normal stream process).

2. For culverts carrying water at crossings, flow capacity should be sufficient to carry peak flows from waste water treatment plant discharges and any known or anticipated discharges from water supply systems (ie. Castaic Lake, DWP, MWD)

3. Natural watercourse bottom and hydraulic conditions will be preferentially selected for diversion channels. If such conditions are not present, the channel will be constructed in consultation with USFWS/CDFG and in accordance with the BMPs and mitigation measures provided in Section 3.1 and in BIO-44 and BIO-45 (Section 4.1).

4. A minimum of 20-cm (8 inches) water depth should be maintained for the whole length of the passage. If base-flow at the time of construction is such that run

habitat units have a mean depth of less than six inches, then the mean depth of the natural run habitats should be mimicked in the bypass channel.

5. Water velocities of less or equal to 60 centimeters per second (cm/s) (2 feet per second (fps)) if a coarse substrate is present or less or equal to 34 cm/s (1.2 fps) if a coarse substrate is not present.

6. The water surface blends smoothly with the natural channel at the up and downstream ends of the passage area. The coarseness and nature of the bottom material should maintain continuity through the passage area and not produce barriers to movement.

As incorporated in the above velocity requirements, substrate roughness locally slows the water velocity near the bottom and near the margins of the stream channel. Thus the average channel velocity can be higher since local areas in the channel will be low enough for fish passage. If surface flow is continuous through the project area, then the diversion structure should convey the appropriate amount of water downstream.

2.7 FISH STRANDING / RESCUE SURVEYS

During a diversion of flow from the existing wetted channel to a diversion channel it is possible that fish and other aquatic species remain in the abandoned channel. In addition, as discussed for dewatering above, it is possible that a dewatering discharge channel becomes occupied and then discharge is stopped, or a dewatering activity reduces the flow in the wetted channel such that species passage is no longer possible. Surveys for fish and other sensitive aquatic species will be conducted during these activities to ensure that no species remain in a dewatered area. Rescued species would be relocated to appropriate aquatic habitats.

This section discusses a general methodology for diverting surface water in river channels occupied by sensitive fish species. The surface water diversion alternatives discussed below are generic plans utilized on various instream projects conducted in the recent past in the Santa Clara River and other local watersheds.

Any diversion design that maintains conditions similar to the natural wetted river channel in the low flow season should allow for fish and other aquatic species passage as that represents conditions prior to the project. For this reason, a bypass channel is more desirable than culverts or other constrictions that increase flow velocities and often impede from movement upstream. As noted in more detail below, some portion of the channel needs to be in the 1 to 2 foot per second velocity regime to allow small fish, such as UTS, to move upstream.

3.1 DIVERSION BYPASS CHANNEL

Construction of an open, natural bottomed, diversion bypass channel is a preferred method when there is sufficient area within the floodplain to construct a channel and divert flow away from the work area.

The area to be considered for diversion should be as level and wide as possible so little or no change in gradient or flow velocity is induced by diverting the water (ie., no excessive channel bed erosion). The new channel should be constructed in a manner to minimize impact to riparian vegetation. Open river wash may be suitable for a short duration diversion, while a long term (ie. a full season) diversion may need to be constructed within an area already containing appropriate vegetative cover or is capable of being re-vegetated. If possible a recently abandoned secondary channel should be utilized. Such a secondary channel should require a minimum amount of excavation and likely will have some riparian or scrub habitat present.

A channel excavated on the wide river floodplain in the vicinity of the existing channel should naturally have a good mix of stream substrates for aquatic fauna and flora. Thus no augmentation of the substrate should be required in most locations on the river floodplain. If the diversion is done early in the spring, such as in March, little of the new seasonal marginal herbaceous vegetation will have developed. Thus the diversion of the water into a sparsely vegetated channel will not be much different than conditions in the wetted flow channel. If the work can be planned to require only one diversion each spring then the need to disrupt the habitat again in returning the channel to its former position would be avoided.

The channel can be allowed to maintain or re-establish a position during winter high flows. Leaving the channel to the fate of high winter flows only applies if the diversion channel is an open channel at or near the grade of the original channel. If flows need to be returned to the original channel, sediment may be discharged downstream. When

returning flows to the original channel, the discharge of sediment should be minimized by installing filter fabric, wattles or silt fencing downstream of the work area. Bypass flows should be introduced into the dewatered area at the lowest velocity possible to allow minimize erosion and turbidity. During the return of flows into the original channel from the diversion channel, a qualified biologist shall survey the de-watered temporary channel to ensure that aquatic organisms are not trapped or stranded. Trapped or stranded aquatic organisms will be placed in water-filled buckets for transport and release into the existing flow channel.

Steeper areas along the river channel are rare but if a diversion is needed in such an area more structural integrity may be needed to prevent erosion from compromising the new channel and allowing water to return into the original channel downstream. The upstream end of the diversion will have to be partially dammed with sand bags, rip-rap, sheet piles, inflatable dams, or other resistant materials and the new channel itself may need to be lined with plastic or other resistant material to prevent erosion. The channel will be protected from erosion or spillage of material from channel and basin banks and slopes using readily available BMPs. BMPs include the placement of filter fabric, silt fencing, straw bales, sand bags on cofferdam banks, channel banks and slopes.

3.2 PIPELINE BYPASS DIVERSION

Pipeline bypass diversions may be required at small tributary inlets with no special status aquatic species present. These divisions will route low-flows from tributaries around the work area. The diversions will consist of sand bag dams and dirt berms to impound flows and redirect them into a plastic pipeline by gravity flow or by pumping as necessary. Conditions or channel geometry may require the excavation of an upstream basin and standpipe to facilitate pumping. When using a gravity flow system, the pipeline will slope continuously downgrade and therefore may have to pass through or near the work area. In earthen bottom channels or basins the intake pipe end will be substantially above the bottom of the ponded water or excavated basin to avoid discharge of sediments.

If diverted water is discharged to the river, placement of effectively sized outlet protection underneath the pipeline outlet may be needed. Protection may be in the form of rock aprons, erosion control fabric, wattles, or silt fencing. Energy dissipation or other protection may not be necessary if the discharge is to an existing hardened structure (culvert, riprap or concrete), to deep water or a heavily vegetated area.· When designing the outlet project, flow depth, roughness, gradient, side slopes, discharge rate, and velocity will be considered. Routine water quality testing to ensure compliance with discharge requirements will be performed.

3.3 DIVERSION CAPACITY

In all cases the temporary bypass diversions should be designed to accommodate increased flows from several natural and man-made sources. This is true for any system at anytime of the year. Diversion of surface water should be scheduled during low flow conditions and outside of the normal precipitation season, normally from about December

1 to March 15. Regardless of the time of construction, weather reports should be consulted on a daily basis when a diversion is in operation.

Other considerations for variable flows include wastewater treatment plant discharge, municipal water supply agency operations, and the Castaic Lake dam annual water release operations. Prior to and during diversion activities, efforts should be made to coordinate with Los Angeles County Sanitation District and Department of Water Resources as to their projected discharge flows (both normal, scheduled maintenance, or during emergency releases). To the extent practical, the range of flows should be accommodated in the diversion design, and during diversion, contact with these entities should help to ensure appropriate response to any rapid decrease in flow through the diversion that could result in fish stranding. In addition, both the Los Angeles Department of Water and Power (DWP) and the Metropolitan Water District (MWD) have pipelines that cross the river and its tributaries upstream of the project area and can release water into the Santa Clara River. DWP also operates dams and water conveyance facilities on San Francisquito and Bouquet Canyon that might unexpectedly affect river flows downstream of these canyons. To the extent feasible, construction schedules should be coordinated with these entities for any scheduled maintenance that could result in significant flows thru the diversion, although these activities remain outside of the control of the project.

3.4 CULVERTED CROSSING

Culverted crossings, similar to those currently employed for agricultural crossings of the Santa Clara River, provide a feasible means to cross the wetted channel during the non-storm season. The use of culverts may be in conjunction with a bypass channel to allow construction equipment and materials to cross the river corridor during a bridge construction project, or simply as a temporary road crossing. As discussed above, avoidance measures, such as temporary construction bridges, will be explored and implemented as feasible prior to consideration of culvert crossings.

Culverts can be placed directly in the wetted channel flow. The culverts allow for an elevated road surface for vehicles to pass over, thus keeping equipment out of the active channel. Typically more than one culvert is used and the number is based on watershed size and current and expected flow conditions at the project site. Culverts are set in a sequential manner such that after one culvert is placed, the active flow channel is directed into that culvert while the next one is installed in the now non-flowing portion of the stream. After all the culverts are installed, backfill is placed over the culverts to create the elevated road surface. If non-riverbed soil materials are used for backfill, implementation of BMPs and soil stabilization (ie., silt fence, soil binders) along the limits of the road fill would be required to control siltation of the adjacent flowing waters. Typically, several culverts will pass the main flow, will additional culverts located in slightly elevated positions to handle any peak flows.

Culverts would provide a safer operating road crossing versus a temporary bridge, which has no permanent abutments, footings, or other supports. However, culvert placement is less desirable because culverts tend to increase flow speeds and often create velocity

barriers to upstream migration. Culverts will be avoided if at all possible due to the difficulty in preserving flow regimes in the 1 to 2 foot per second velocity range. Culverted crossings will also need to be installed and removed with similar exclusion activities as described above, as well as implementation of mitigation measures to protect water quality during removal activities where native riverbed materials were not used for the roadbed backfill.

Where culverted road crossings are necessary, additional stream enhancement may be proposed to provide adequate habitat for sensitive fish species. This may include pools of slow moving water above and below the culvert crossing, or other wetted channel features.

3.5 FISH PASSAGE

All such modifications to the stream would be expected to mimic the natural stream flow as much as possible. Provision of fish passage (small southern California native species, including UTS) is necessary to maintain continuity of the fish populations upstream and downstream of the project area. In the case of culverts, flow should be slow enough for fish to pass through in both directions. This may be infeasible in the many channel culverts, therefore other stream habitat enhancement may be implemented to provide fish passage in side channels away from the main flow channel. Passage is mostly discussed for upstream movement since small fish can easily go downstream though even fast-flowing areas as long as appropriate receiving habitat is present a short distance downstream and no screens or high falls (more than a few inches or so) are present. Specifications of flow under and around crossings and other stream modifications usually contain several factors. Thus, for any area being considered for fish passage, the following requirements should be met:

1. The passage area should be equal or greater in width than the width of the active channel bed (to maintain normal stream process).

2. For culverts carrying water at crossings, flow capacity should be sufficient to carry peak flows from Waste water treatment plant discharges and any known or anticipated discharges from water supply systems (ie. Castaic Lake, DWP, MWD)

3. Natural watercourse bottom and hydraulic condition is preferred, and if not present, additional BMPs and mitigation measures must be implemented to prevent excessive erosion or siltation of the aquatic habitats.

4. A minimum of 20-cm (8 inches) water depth should be maintained for the whole length of the passage. If base-flow at the time of construction is such that run habitat units have a mean depth of less than six inches, then the mean depth of the natural run habitats should be mimicked in the bypass channel.

5. Water velocities of less or equal to 60 centimeters per second (cm/s) (2 feet per second (fps)) if a coarse substrate is present or less or equal to 34 cm/s (1.2 fps) if a coarse substrate is not present.

6. The water surface blends smoothly with the natural channel at the up and downstream ends of the passage area. The coarseness and nature of the bottom material should maintain continuity through the passage area and not produce barriers to movement.

If surface flow is continuous through the project area, then the diversion structure should convey the appropriate amount of water downstream.

3.6 FISH STRANDING SURVEYS

During a diversion of flow from the existing wetted channel to a culvert it is possible that fish and other sensitive aquatic species remain in the abandoned channel. In addition, if a low flow channel is created to allow fish passage outside of the high velocity main channel, during periods of unusually low flow the channel could become dry. As the culverts are removed from service, fish could be stranded in areas outside of the primary flow channel. Surveys for aquatic species will be conducted during these activities to ensure that no species remain in a dewatered area. Species would be relocated to appropriate aquatic habitats.

3.7 SURFACE WATER PUMPING

At times, pumping of surface water is required to dewater the project area. Surface water pumping activities need to have adequate measures in place to ensure no species (fish and amphibian species are susceptible) become entrained or sucked into the pump. Screening of the pump intakes is the best way to avoid impacts to aquatic species. There are numerous methods that have been utilized by contractors to screen pump intakes. One successful method is to put the pump into a bucket or sufficient sized container and add gravel to the container. This method avoids issues with debris fouling the screens. If screens were utilized, $1/8^{th}$ inch mesh would be required. Preferably the pump would be inserted into a sufficient sized container and screening be placed over the opening of the container. All screens need to be cleaned daily of debris. If the dewatered area was contiguous with the river flow during dewatering it must also be monitored for stranded species that may appear. Many dewatering projects utilize well points, and therefore do not present direct danger to fish as the withdrawal of water is from subsurface pumps in isolated well casings.

Pumping discharge is generally spread in floodplain areas away from the wetted channel, in many cases being beneficially used as agricultural irrigation, irrigation of riparian areas (either for mitigation obligations or as a general measure to support riparian vegetation growth along the margin of the river), or infiltrated at large holding pools. Water is generally allowed to sink back into the water table, or beneficially utilized within the site or surrounding agricultural operations. Where appropriate, direct discharge to the river may be authorized through the Los Angeles Regional Water Quality Control Board General NPDES Permit for Creekside Construction Dewatering. Depending on the amount of water produced, multiple settling pools may be needed. They need to be placed well away from the wetted channel to reduce the impact on stream flows and to ensure no excessive turbidity levels are created in the flowing

channel. If pumped water is discharged to the river, placement of effectively sized outlet protection underneath the pipeline outlet of where diverted water is discharged into stream may be needed. Protection may be in the form of rock aprons, erosion control fabric, wattles, or silt fencing. Energy dissipation or other protection may not be necessary if the discharge is to an existing hardened structure (culvert, riprap or concrete), to deep water or a heavily vegetated area.· When designing the outlet project, flow depth, roughness, gradient, side slopes, discharge rate, and velocity will be considered. Furthermore, authorizations for creekside dewatering from the LARWQCB require routine water quality testing to ensure compliance with discharge requirements.

4.1 MITIGATION MONITORING

Following is a mitigation strategy and mitigation measures incorporated into applicable permits for the Newhall Ranch Project. These measures are required to be implemented for sensitive species avoidance and exclusion during construction of RMDP components, primarily Bridges over the Santa Clara River, Bank Stabilization along the Santa Clara River, and temporary haul routes crossing the Santa Clara River.

SEE RMDP Master Streambed Agreement BIO-14, and BIO-43 thru BIO-49

BIO-14 Temporary impacts from construction activities in the riverbed shall be restricted to the following areas of disturbance: (1) an 85-foot-wide zone that extends into the river from the base of the rip-rap or gunite bank protection where it intercepts the river bottom; (2) 100 feet on either side of the outer edge of a new bridge or bridge to be modified; (3) a 60-foot-wide corridor for utility lines; (4) 20-foot-wide temporary access ramps; and (5) 60-foot roadway width temporary construction haul routes. The locations of these temporary construction sites and the routes of all access roads shall be shown on maps submitted with the sub-notification letter submitted to the Corps and CDFG for individual project approval. Any variation from these limits shall be submitted, with a justification for a variation for Corps and CDFG approval. The construction plans should indicate what type of vegetation, if any, would be temporarily disturbed or removed and the post-construction activities to facilitate revegetation of the temporarily impacted areas.

The boundaries of the construction site and any temporary access roads within the riverbed shall be marked in the field with stakes and flagging. No construction activities, vehicular access, equipment storage, stockpiling, or significant human intrusion shall occur outside the work area and access roads.

BIO-43 Prior to initiating construction for the installation of bridges, storm drain outlets, utility lines, bank protection, trails, and/or other construction activities that impact the wetted channel, aquatic habitats within construction sites and access roads, as well as all aquatic habitats within 300 feet of construction sites and access roads, shall be surveyed by a qualified biologist for the presence of the unarmored threespine stickleback, arroyo chub, and Santa Ana sucker. The Corps and the CDFG shall be notified at least 10 days prior to the survey and shall have the option of attending. The biologist shall file a written report of the survey with both agencies within 14 days of the survey and no later than 10 days prior to any construction work in the riverbed. If there is evidence that fish

spawn has occurred in the survey area, then surveys shall cease unless otherwise authorized by USFWS.

Construction within aquatic habitats shall only occur when it is determined that juvenile fish are not present within the Project area.

BIO-44 Temporary bridges, culvert crossings, or other feasible methods of providing access across the river shall be constructed outside of the winter season and not during periods when spawning is occurring. Prior to the construction of any temporary or permanent crossing of the Santa Clara River, the permittee and/or subpermittee shall develop a Stream Crossing and Diversion Plan. The plan shall include the following elements: the timing and methods for pre-construction aquatic species surveys; a detailed description of the diversion methods (e.g., berms shall be constructed of on site alluvium materials of low silt content, inflatable dams, sand bags, or other approved materials); special-status species relocation; fish exclusion techniques, including the use of block netting and fish relocation; methods to maintain fish passage during construction; channel habitat enhancement, including the placement of vegetation, rocks, and boulders to produce riffle habitat; fish stranding surveys; and the techniques for the removal of crossings prior to winter storm flows. The Plan shall be submitted to the USFWS and CDFG for approval at least 30 days prior to implementation.

If adult special-status fishes are present and spawning has not occurred, they shall be relocated prior to the diversion or crossing. Block nets of 1/8-inch woven mesh will be set upstream and downstream. On days with possible high temperature or low humidity (temperatures in excess of 80° F), work will be done in the early morning hours, as soon as sufficient light is available, to avoid exposing fishes to high temperatures and/or low humidity. If high temperatures are present, the fishes will be herded to downstream areas past the block net. Once the fishes have been excluded by herding, a USFWS staff member or his or her agents shall inspect the site for remaining or stranded fish. A USFWS staff member or his or her agents shall relocate the fish to suitable habitat outside the Project area (including those areas potentially subject to high turbidity). During the diversion/relocation of fishes, the USFWS or his or her agents shall be present at all times.

BIO-45 a. Stream diversion bypass channels: Stream diversion bypass channels will be constructed when the active wetted channel is within the work zone. Diversion bypass channels will be built in accordance with BIO-44 and in consultation with CDFG/USFWS. Equipment shall not be operated in areas of ponded or flowing water unless authorized by CDFG/USFWS. The diversion channel shall be of a width and depth comparable to the natural river channel. In all cases where flowing water is diverted from a segment of the stream channel, the bypass channel will be constructed prior to the diversion of the active stream. The bypass channel will be constructed prior to diverting the stream, beginning

in the downstream area and continuing in an upstream direction. Where feasible and in consultation with CDFG/USFWS, the configuration of the diversion channel will be curved (sinuous) with multiple sets of obstructions (i.e., boulders, large logs, or other CDFG/USFWS-approved materials) placed in the channel at the point of each curve (i.e., on alternating sides of the channel).

If emergent aquatic vegetation is present in the original channel, the permittee and/or subpermittee will transplant suitable vegetation into the diversion channel and on the banks prior to or at the time of the water diversion. A qualified restoration ecologist will supervise the construction of the diversion channels on site. The integrity of the channel and diversion shall be maintained throughout the intended diversion period. Channel bank or barrier construction shall be adequate to prevent seepage into or from the work area. Construction of diversion channels shall not occur if surveys determine that gravid fish are present, spawning has recently occurred, or juvenile fish are present in the proposed construction areas. At the conclusion of the diversion, either at the commencement of the winter season, or the completion of construction, the permittee and/or subpermittee will coordinate with CDFG/USFWS to determine if the diversion should be left in place or the stream returned to the original channel.

If CDFG/USFWS determine the stream should be diverted to the original channel, the original channel will be modified prior to re-diversion (i.e., while dry) to construct curves (sinuosity) into that channel, including the placement of obstructions (i.e., boulders, large logs, or other CDFG/USFWS-approved materials). The original channel will be replanted with emergent vegetation as the diversion channel was planted. If the diversion channel is abandoned, the boulders will remain in place. b. Dewatering: Construction dewatering in close proximity to stream flow shall implement the following: Assess local stream and groundwater conditions, including flow depths, groundwater elevations, and anticipated dewatering cone of influence (radius of draw down). Assess surface water elevations upstream, adjacent to, and downstream of the extraction points, to assess any critical flow regimes susceptible to excessive draw down and therefore fish stranding issues.

Assess surface water elevations downstream of the discharge locations (if discharge is proposed to the flowing stream) to assess any flow regimes and overbank areas that may be susceptible to flooding and therefore fish stranding at the cessation of discharge. Discharge locations shall also be assessed for potential channel bed erosion from dewatering discharge, and appropriate BMPs must be implemented to prevent excessive erosion or turbidity in the discharge. The information above shall be summarized and provided in a plan approved by

CDFG and Corps. Fish shall be excluded from any artificial flowing channels from dewatering discharge. Methods to ensure separation may include, but are not limited to: block netting at the confluence; creation of a physical drop greater than four inches at the confluence; or maintaining a velocity range unsuitable for fish passage, such as a berm at the confluence with small diameter pipes for discharge.

BIO-46 During any stream diversion or culvert installation activity, a qualified biologist(s) shall be present and shall patrol the areas within, upstream, and downstream of the work area. The biologists shall inspect the diversion and inspect for stranded fish or other aquatic organisms. Under no circumstances shall the unarmored threespine stickleback be collected or relocated, unless USFWS personnel or their agents implement this measure. Any event involving stranded fish shall be recorded and reported to CDFG and USFWS within 24 hours.

BIO-47 Slow moving water habitats shall be constructed upstream and downstream of any river crossing or bridge construction area to provide refuge for special-status fishes during construction. Where feasible and in consultation with CDFG and USFWS, the permittee and/or subpermittee shall enhance slow-moving water habitats for each linear foot disturbed by hand-excavating shallow side channels and placing multiple sets of obstructions (e.g., boulders, large logs, or other CDFG- and USFWS-approved materials) in the channel.

BIO-48 Installation of bridges, culverts, or other structures shall not impair the movement of fish and aquatic life. Bottoms of temporary culverts shall be placed at or below channel grade. Bottoms of permanent culverts shall be placed below channel grade. Culvert crossings shall include provisions for a low flow channel where velocities are less than two feet per second to allow fish passage.

BIO-49 Water containing mud, silt, or other pollutants from construction activities shall not be allowed to enter a flowing stream or be placed in locations that may be subject to normal storm flows during periods when storm flows can reasonably be expected to occur.

BIO-52 (1) Prior to grading and construction activities, a qualified biologist shall be retained to conduct a Worker Environmental Awareness Program (WEAP) for all construction/contractor personnel. A list of construction personnel who have completed training prior to the start of construction shall be maintained on site and this list shall be updated as required when new personnel start work. No construction worker may work in the field for more than five days without participating in the WEAP. Night work and use of lights on equipment shall not be allowed unless CDFG approves of the night work and use of lights. Lighting shall not be used where threatened or endangered species occur. Lights shall be

directed from natural areas and remain 200 feet away from natural areas unless otherwise approved by CDFG. (2) The qualified biologist shall provide ongoing guidance to construction personnel and contractors to ensure compliance with environmental/permit regulations and mitigation measures. The qualified biologist shall perform the following:

- Provide training materials and briefings to all personnel working on site. The material shall include but not be limited to the identification and status of plant and wildlife species, significant natural plant community habitats (e.g., riparian), fire protection measures, and review of mitigation requirements.

BIO-70 Construction plans shall include necessary design features and construction notes to ensure protection of vegetation communities and special-status plant and aquatic wildlife species adjacent to construction. In addition to applicable erosion control plans and performance under SCAQMD Rule 403d dust control (SCAQMD 2005), the Project stormwater pollution prevention plan (SWPPP) shall include the following minimum BMPs. Together, the implementation of these requirements shall ensure protection of adjacent habitats and wildlife species during construction. At a minimum, the following measures/restrictions shall be incorporated into the SWPPP, and noted on construction plans where appropriate, to avoid impacting special status species during construction: • Avoid planting or seeding invasive species in development areas within 200 feet of native vegetation communities.

- Provide location and details for any dust control fencing along Project boundaries (BIO 71).

- Vehicles shall not be driven or equipment operated in areas of ponded or flowing water, or where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as otherwise provided for in the 404 Permit or 1603 Agreement.

- Silt settling basins installed during the construction process shall be located away from areas of ponded or flowing water to prevent discolored, silt-bearing water from reaching areas of ponded or flowing water during normal flow regimes.

- If a stream channel has been altered during the construction and/or maintenance operations, its low flow channel shall be returned as nearly as practical to pre-Project topographic conditions without creating a possible future bank erosion problem or a flat, wide channel or sluice-like area. The gradient of the streambed shall be returned to pre- Project grade, to the extent practical, unless it represents a wetland restoration area.

- Temporary structures and associated materials not designed to withstand high seasonal flows shall be removed to areas above the high water mark before such flows occur.

- Staging/storage areas for construction equipment and materials shall be located outside of the ordinary high water mark.

- Any equipment or vehicles driven and/or operated within or adjacent to the stream shall be checked and maintained daily, to prevent leaks of materials that could be deleterious to aquatic life if introduced to water.

- Stationary equipment such as motors, pumps, generators, and welders which may be located within the riverbed construction zone shall be positioned over drip pans. No fuel storage tanks shall be allowed in the riverbed.

- No debris, bark, slash sawdust, rubbish, cement or concrete or washing thereof, oil, petroleum products, or other organic material from any construction, or associated activity of whatever nature, shall be allowed to enter into, or be placed where it may be washed by rainfall or runoff into, watercourses included in the permit. When construction operations are completed, any excess materials or debris shall be removed from the work area.

- No equipment maintenance shall be done within or near any stream where petroleum products or other pollutants from the equipment may enter these areas with stream flow.

- The operator shall install and use fully covered trash receptacles to contain all food, food scraps, food wrappers, beverage containers, and other miscellaneous trash.

- The operator shall not permit pets on or adjacent to the construction site.

- No guns or other weapons are allowed on the construction site during construction, with the exception of the security personnel and only for security functions. No hunting shall be authorized/permitted during construction.

- The Permittee shall apply any herbicides/pesticides in accordance with state and federal law. No herbicides/pesticides shall be used where threatened or endangered species occur. No herbicides/pesticides shall be sprayed when wind velocities are above 5 miles per hour.

RMDP Section 7.7.1 Additional Maintenance Provision: Native vegetation within temporary maintenance work areas may be mulched and spread, where appropriate, over the temporary impact areas once maintenance work is complete in order to facilitate revegetation. If vegetation is cut to ground level only, with the likelihood of re-growth, then cuttings may be removed from the maintenance site for recycling.

Temporary sediment retention ponds shall be constructed downstream of maintenance sites which involve grading or excavating, and that contain flowing

or pounded water that drains off site into the undisturbed stream flow or ponds. The sediment ponds shall be constructed of riverbed material and shall prevent sediment-laden water from reaching undisturbed ponds or stream flows. To the extent feasible, ponds shall be located in barren or sandy river bottom areas devoid of existing riparian scrub, riparian woodland, or aquatic habitat. The ponds shall be maintained and repaired after flooding events, and shall be restored to pre-disturbance grades and substrate conditions within 30 days after maintenance work has ended.

Pre-construction surveys are also required for Aquatic and Semi-aquatic special status species as described in the mitigation measures below (parenthetical summary measures provided, please see Fish and Game MSAA permit for full text):

BIO-17 (Conduct focused surveys for arroyo toad and, if present, implement measures required by the USFWS Biological Opinion for arroyo toad, and develop and implement a monitoring plan in consultation with the USFWS and CDFG)

BIO-18 (Conduct focused surveys for California red-legged frog and, if present, implement measures required by the USFWS Biological Opinion for California red-legged frog, and develop and implement a monitoring plan in consultation with the USFWS and CDFG)

BIO-50 (Conduct focused surveys for southwestern pond turtle and, if present, prepare and implement a monitoring plan)

BIO-53 (pre-construction surveys and habitat creation for western spadefoot toad)

BIO-89 (pre-construction surveys and relocation of two-striped garter snake and south coast garter snake)

The RMDP also contains a Maintenance Manual (Appendix) for storm flow conveyance and water quality treatment facilities (i.e., WQ Basins, swales, infiltration basins, etc). The diversion discussions above also apply to management and/or diversion of flows within the storm drain systems, however, many of the biological concerns discussed in the preceding text do not apply to such flows as they are generally devoid of native species. Measures to prevent contamination of downstream waters and surveys to confirm presence/absence of sensitive species do apply.

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Cooey, and B. Collins. 1998. California Salmonid Stream Habitat Restoration Manual Vol. II. State of California, The Resource Agency, California Department of Fish and Game, Inland Fisheries Division.

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