The determination of the evaporation rate is described in Appendix A in the "Evaporation and Precipitation" section. The match of the measured surface temperatures with DYRESM simulations using various evaporation coefficient values provided the best estimate of 48 inches per year, as shown in Figure A-5.

The Mono Lake water budget used in LAAMP includes an unmeasured inflow of 34,000 acre-feet per year plus 5% of the measured runoff. Therefore, there was usually additional water needed in the DYRESM model to match the LAAMP end-of-month volumes. This additional water was assumed to be groundwater and was distributed with an assumed vertical pattern in DYRESM. In this way, the DYRESM model was made consistent with the LAAMP water budget results.

The DYRESM results indicated that the probability of meromixis increased with inflow and thus was greater during the transition period to higher lake levels. However, because the DYRESM results were not linked directly with the brine shrimp productivity model, they did not greatly influence the impact assessment of brine shrimp productivity.

## WILDLIFE (F)

### F1. Prediversion Population Estimates of Ducks and Other Migratory Water Birds Were Unreliable

#### Summary of Comments

Descriptions of prediversion populations of ducks and other migratory water birds at Mono Lake were unreliable because they were based on anecdotal sources and the recollections of untrained observers made 50 years ago.

#### Response

Ideally, SWRCB consultants would have relied on data published in refereed journals to describe prediversion water bird populations at Mono Lake. Unfortunately, however, few references published before 1941 included systematic observations of the lake's water birds.

Three articles reviewed by SWRCB consultants contained detailed information about water birds in the prediversion years, including a journal article by Fisher (1902) and books by Dawson (1923), and Grinnell and Storer (1924). In addition to these published sources, SWRCB consultants reviewed and cited the field notes of Joseph Dixon, Joseph Grinnell, and Walter Taylor taken during the period 1916-1922 (available at the Museum of Vertebrate Zoology, University of California, Berkeley).

Joseph Dixon visited Mono Basin for almost 2 months (from early May until early July 1916), but most fieldwork conducted there by Dawson, Grinnell, and Fisher lasted for only a few days or weeks in different years and their field notes and published works comprised an incomplete historical record for ducks and other wildlife at Mono Lake.

SWRCB consultants also reviewed and cited published articles summarizing historical population trends of California gulls (Jehl et al. 1984, 1988; Winkler and Shuford 1988), and Wilson's phalaropes and eared grebes at Mono Lake (Jehl 1988a). These publications relied extensively on unpublished field notes, newspaper articles, books on regional human history, egg collection records in major western museums, or interviews with historical residents because they were the best and only sources of information available.

Transcripts of interviews with long-term residents of Mono Basin provided detailed information that was unavailable from other sources. In addition to reviewing these transcripts, SWRCB consultants conducted independent telephone and in-person interviews with several prediversion observers (e.g., Don Banta, Kent DeChambeau, Wallis McPherson, and Eldon Vestal) to determine their experience with ducks and other water birds at Mono Lake. These observers were questioned about their wildlife observation techniques (i.e., did they have boats and optical equipment) and their overall experience with ducks and other water birds at the lake. These observers were also asked if they knew Walter Dombrowski, a seasonal aide for DFG, who conducted the only systematic waterfowl counts at Mono Lake in 1948 (Dombrowski 1948).

It is true that memories often fail, especially after half a century. However, Banta, DeChambeau, McPherson, and Vestal gave clear, and nearly identical, descriptions of huge concentrations of ducks they had seen and hunted during many fall migrations at Mono Lake in the 1930s, 1940s, or 1950s. All these observers mentioned the same species of ducks they had hunted and accurately recalled the major field marks that distinguish the common migratory species at the lake.

Banta and McPherson reported that large concentrations of ducks continued to visit Mono Lake until sometime in the early or mid-1960s. They recalled that duck populations declined abruptly when ponds, lagoons, springs, and other sources of fresh and brackish water around the lakeshore disappeared with declining lake elevations (i.e., between about 6,400 and 6,405 feet mean sea level [msl]).

Banta, DeChambeau, McPherson, and Vestal had all hunted with Walter Dombrowski and knew him well. They described him as a careful and experienced waterfowl observer who had an exceptional ability to identify waterfowl at long distances, even when they were in flight. Dombrowski's (1948) highest count of "well over a million ducks" on November 1, 1948, was consistent with their recollections of peak migratory waterfowl concentrations in the early diversion years. These observers agreed that major declines in the lake's migratory duck population had occurred and that point-of-reference populations represented a minute fraction of the numbers they had seen in the prediversion and early diversion years.

In 1942, DFG (then called the Division of Fish and Game) published a map of statewide game kills from 1940. This map was recently discovered by DFG personnel (Thomas pers. comm.) and was not available to SWRCB consultants for review during preparation of the draft EIR. Mono County reported 5,000 ducks on hunter return questionnaires; of these, 3,000 were taken on the north shore of Mono Lake near the DeChambeau duck ponds, and 2,000 were killed at Grant Lake, Rush Creek, and its tributaries (SWRCB Exhibit DFG-95). These data further corroborate the recollections of long-term residents that Mono Lake was a major duck hunting area in the prediversion years.

Published or unpublished data have not been provided in any of the comment letters on the draft EIR or in the SWRCB hearings to refute that a major loss of migratory ducks and their preferred wetland habitats has occurred at Mono Lake. Lacking any published data, interviews with long-term residents continue to provide the best and most complete sources of information available on prediversion and early diversion duck populations at the lake.

Further discussions of CEQA requirements regarding inclusion of unpublished materials in EIRs are provided in response to Comment X3.

## F2. Prediversion Waterfowl Habitats at Mono Lake Were Insufficient to Support One Million Migratory Ducks

### Summary of Comments

The amount of prediversion waterfowl habitats at Mono Lake (i.e., 260 acres of ponds and lagoons) as described in the draft EIR appear insufficient to support up to 1 million migratory ducks.

### Response

The draft EIR reported that about 260 acres of fresh and brackish water ponds and lagoons existed around the lakeshore before 1940 (draft EIR, Table 3F-6). In addition to these wetland wildlife habitats, freshwater marsh covered 133 acres of the Rush Creek delta plain (SWRCB Hearing Testimony of Scott Stine). The existence of this large marsh area was unknown to SWRCB consultants at the time the draft EIR was prepared. Therefore, all references to 260 acres should be revised to reflect that about 390 acres of fresh and brackish water wetlands once existed around the lakeshore.

At Mono Lake, migratory ducks were abundant at most fresh water habitats, including ponds, creek deltas, and large spring discharge areas. Ponds, lagoons, and sheltered embayments provided important refuges from the lake's high waves during frequent periods of high winds (Banta, DeChambeau, McPherson, and Vestal pers. comms.).

As noted in the draft EIR (pages 3F-41 and 42), migratory ducks usually avoid hypersaline lakes unless sources of freshwater are available nearby. Studies in North Dakota concluded that most ducks frequent lakes with sheltered bays and chemical stratification providing a thin layer of fresh water floating on the saline water below (Swanson et al. 1984).

According to Walter Dombrowski's map, referenced in the draft EIR (page 38, paragraph 3), most of the ducks observed during his fall censuses were concentrated on the chemically stratified waters of Mono Lake, including the Rush Creek delta (45%), Lee Vining Creek delta (10%), DeChambeau Lagoon (also known as County Ponds) (15%), Warm Springs (5%), Simon's Spring (15%), and South Tufa (5%). Thus, migratory ducks frequented the lake's extensive nearshore waters and shoreline ponds and lagoons.

Since the draft EIR was prepared, SWRCB consultants have reviewed two new important sources of information, including a report prepared for SWRCB by Dr. Scott Stine (SWRCB Hearing Testimony of Scott Stine) concerning the lake's historical and modern waterfowl habitats, and summaries of field notes taken by Joseph Dixon and Joseph Grinnell during the 1930s and prepared by Emilie Strauss (pers. comm.).

Dr. Stine's report identified important prediversion creek and spring discharge areas that created freshwater lenses floating on the surface of Mono Lake. These freshwater lenses encircled the mouths of Rush, Lee Vining, DeChambeau, Wilson, and Mill Creeks, as well as former spring discharge areas near South Tufa, Horse Creek embayment, DeChambeau Ranch embayment, Monte Vista Springs, Simon's Spring, and Warm Springs (SWRCB Hearing Testimony of Scott Stine). According to this report (page 2, paragraph 2):

> Each of these areas was characterized by an abundance of freshwater that was derived from streams and/or springs. These influxes of freshwater did not simply dilute the hypersaline waters of Mono Lake. Rather, the fresh water inflow, being far lighter than salt water, floated as a lens on the surface of the lake--a phenomenon known as "hypopycnal stratification".

Joseph Grinnell's field notes from June 20, 1937, clearly described his observations of freshwater habitats along the lake's shoreline:

> Coves at the bases of the "hills," where much water seeps out of old water laid formations are luxuriant with vegetation: cottonwoods, willows, sheperdia, sedges, reeds, water cress, mimulus, orchids, etc., very rankly growing. In long stretches this freshwater goes down to within one yard of the edge of the lake water, oozing through the beach gravel or pebbles into the heavily alkaline water. There is thus no haline vegetation--all freshwater plants right down to the farthest lakeshore, the water level of which has been perhaps 7 feet higher than now (as attested by ancient stubs of willows in place), but also lower, as shown by such stubs quite a way out beneath the surface of water.

Thus, from a duck's perspective, Mono Lake's shoreline and nearshore waters were fresh water and offered thousands of acres of shallow, open water habitat. These areas were used extensively by migratory ducks, in addition to the 390 acres of ponds, lagoons, and freshwater marshes around the lakeshore.

## F3. Superabundant Food Source for Water Birds Was Not Recognized

### Summary of Comments

Alkali flies and brine shrimp provided a superabundant food source for nesting and migratory water birds at all historical elevations of Mono Lake, as evidenced by healthy populations of eared grebes, Wilson's phalaropes, and red-neck phalaropes that gain weight while at the lake.

### Response

It may appear to human observers that alkali flies and brine shrimp constitute superabundant food resources for water birds at Mono Lake. However, the foraging requirements of individual water birds vary and species respond differently to changes in prey density.

If unlimited food is available, a predator might be expected to exhibit a functional response to increasing prey densities and reach a satiation level where higher prey availability would not induce a higher number of foraging attempts (Krebs 1978, Krebs and Davies 1978, Pianka 1983). Empirical data from laboratory and field studies are required to determine if water birds exhibit functional responses at all recorded densities of invertebrate prey at Mono Lake.

The term "superabundance" was never defined clearly in the comment letters. However, it implies that alkali fly and brine shrimp populations are available in such massive numbers that even relatively low densities of these prey species represent an unlimited food source for water birds at Mono Lake.

In preparing the draft EIR, SWRCB consultants reviewed an extensive literature on water bird populations at Mono Lake but only a few studies provided quantitative data on foraging behavior, diets, or responses to changes in prey density. Jehl (1988a) described the diets of eared grebes and red-necked phalaropes and Jehl and Chase (1987), Cooper et al. (1984), and Winkler (1983a) documented the diets of California gulls. However, only Rubega's (1993) laboratory and field studies examined the response of red-necked phalaropes to changes in prey density.

The primary data presented to support the hypothesis that invertebrate food is superabundant at Mono Lake are summarized in Dr. Joseph R. Jehl's written testimony to the SWRCB (SWRCB Testimony of Dr. Joseph R. Jehl, Jr.). Figure 7 of Jehl's testimony illustrates peak counts of migratory eared grebes, red-necked phalaropes, and California gull nests compared to the relative abundance of brine shrimp at various lake elevations from 1979 until 1992. Figure 7 does not illustrate trends in alkali fly production, although the flies are the primary food source for many migratory water birds, including red-necked phalaropes.

During the years illustrated in Figure 7 of Jehl's testimony, the lake's elevation varied between its historical lowstand of 6,372 feet in 1982 and its most recent highstands of about 6,381 feet in 1984 and 1986. According to Figure 7, the average yearly abundance of brine shrimp had a nearly inverse relationship with lake elevation and reached its highest recorded levels of about 22,000 shrimp per square meter at the lowstands of 1982 and 1989, while falling to 11,000 or fewer shrimp per square meter during the lake's 1984 and 1986 highstands.

More than 500,000 eared grebes were reported in every year and more than 950,000 grebes were observed in 1992 when brine shrimp abundance was relatively low (Figure 7 of Jehl's testimony). These data suggest that eared grebes were abundant and had enough food during the lowest recorded brine shrimp production years. Although, eared grebes consume large numbers of alkali fly larvae during summer and early fall, they rely almost entirely on brine shrimp in late fall when the grebes' numbers are highest (draft EIR, page 3F-23, paragraph 6; SWRCB Testimony of Dr. Joseph R. Jehl, Jr.).

Figure 1 of Jehl's testimony illustrates weight gains of adult eared grebes in relation to declining brine shrimp densities at Mono Lake in 1991. No information is offered on how the points on this graph were derived, but they appear to represent mean values of grebes collected on different dates rather than sequential measurements of the same birds through time. Since confidence intervals were not presented in Figure 1, the range of weight variations of birds collected on each date could not be examined. Similarly, the lack of data on population turnover rates could mean that grebes gained weight at Mono Lake, or alternatively, that they gained weight at another location (e.g., Abert Lake) prior to their arrival at the lake.

Despite the lack of data on weight gain or turnover rate for grebes, no evidence is available to suggest that their populations are limited by the availability of invertebrate prey at Mono Lake. Thus, the draft EIR (page 3F-24, paragraph 3) concluded that "alkali fly and brine shrimp populations were sufficient to meet eared grebe requirements at the lake's historical lowstand in 1982, the point-of-reference, and through 1992".

Data are lacking to support the hypothesis that invertebrate prey have always been superabundant for California gulls. As noted in Appendix C of the draft EIR (page C-14, paragraph 3), many California gull chicks died late in the 1981 breeding season and Winkler (1987) suggested that heat stress and possibly food shortages may have limited gull reproductive success in that year.

Specifically, Winkler (1987) reported that total brine shrimp production was not depressed compared to earlier years but the timing of shrimp emergence was shifted approximately 1 month later. A similar delay in brine shrimp availability was also noted in 1982, when gulls were observed to forage extensively on cicadas as an alternate food source until brine shrimp populations recovered in July of that year. The 1982 season, however, was the only year in the 13 years since intensive studies began that gulls have consumed large numbers of cicadas (Winkler, Shuford pers. comms.).

In the absence of data on unpredictable and uncommon food sources such as cicadas, how delayed food supplies, as in 1982, might have affected the gulls cannot be determined. In years of delayed brine shrimp emergence, food cannot be assumed to be superabundant for nesting gulls.

Figure 7 of Jehl's testimony illustrates peak counts of red-necked phalaropes at Mono Lake which have ranged from a low of 8,000 birds in 1983 to a high of 45,000 in 1993. Population trends in Wilson's phalaropes, whose migratory populations at Mono Lake have shown a dramatic decline since at least 1989 (Rubega pers. comm.), are not illustrated in Figure 7.

Figure 5 of Jehl's testimony displays weights of male and female red-necked phalaropes as a function of Julian dates and implies that both male and female phalaropes gained weight during their migratory stops at different lakes. As with the weight gain data presented for eared grebes in Figure 1 of Jehl's testimony, however, the red-necked phalarope data were apparently derived from collection of birds on different dates and not from sequential measurements of the same individuals through time.

Figure 5 of Jehl's testimony groups data from different years and lakes, most of which are represented by samples too small for statistical analysis. For example, the graph for males shows four 1992 samples from Mono Lake collected on two dates, one 1992 sample from Abert Lake, and four 1992 samples from Great Salt Lake collected on two dates. The graph for females contains data derived from similar sample groups. Although the samples are statistically inadequate, casual inspection of Figure 5 suggests that Mono Lake and Great Salt Lake may have different slopes; however, the graphs and text lack regression equations, regression coefficients, or any tests of significance that would permit independent analysis of these reported weight gain trends.

As stated above, eared grebes and red-necked phalaropes may gain weight during their stay at Mono Lake but data from the same birds at different points in time are not available to test this hypothesis. Rubega (1993) provides the only quantitative data on red-necked phalarope foraging behavior at Mono Lake. Her detailed laboratory studies concluded that prey density had a significant, and positive, effect on the prey capture attempt rate and feeding efficiency of both male and female phalaropes.

Individual phalaropes used in Rubega's (1993) experiments varied in their foraging attempt rates, success rates, and efficiency, but all (both sexes) continued to increase their feeding rates at alkali fly densities that were several, or many, times higher than those available at Mono Lake. Even those individuals that exhibited functional responses, or upper limits, to their feeding attempt rates in the laboratory (and some did not) did so at prey densities that were several thousand times higher than average field densities at the lake (Rubega 1993).

Rubega's study demonstrates that red-necked phalaropes at Mono Lake forage at rates that are far lower than their maximum rates observed in the laboratory and thus have the mechanical ability to capture and consume more alkali flies than they currently do in the wild. Therefore, current prey densities at the lake cannot be assumed to be nonlimiting for this species.

No evidence supports the assertion that current and point-of-reference invertebrate prey populations constitute a superabundant food resource for all water birds at Mono Lake. Availability of brine shrimp appears to be nonlimiting for eared grebes because the grebe's population was large and healthy at all historical lake elevations. However, California gulls could be adversely affected by late brine shrimp hatches in some years, especially if unpredictable food sources such as cicadas were not available. Similarly, laboratory studies and recent observational data (see following response to Comment F4) suggest that alkali flies may be limiting, rather than superabundant, for red-necked phalaropes.

## F4. Food Supply Was Incorrectly Identified as Restricting Phalarope Distribution

### Summary of Comments

The current restricted distribution of Wilson's and red-necked phalaropes in the northeastern sector of Mono Lake is not related to reduced food supplies and could be caused by other factors such as increased tourism.

### Response

The draft EIR described the past and current distributions of red-necked phalaropes at Mono Lake (pages 3F-26, paragraphs 3 and 5, and page 3F-27, paragraphs 4 and 5). Until recently, this species was widespread at the lake, including during the lake's historical lowstand in 1981 and 1982 (Jehl 1986b). However, since at least 1989, phalaropes have been almost entirely restricted to the lake's northeastern sector and a small area near the Negit Island embayment (Jehl, Rubega pers. comms.).

Jehl (SWRCB Hearing Testimony of Dr. Joseph R. Jehl, Jr., page 41, paragraph 1) concluded that there was no general correlation between the surface elevation of Mono Lake and the distributional pattern of phalaropes. His testimony (page 39, paragraph 4) stated that the eastern side of Mono Lake was not used to a great extent during 1981 and 1982. Earlier Jehl (1986b) data, however, indicate that on seven of fourteen dates at least 2,000 red-necked phalaropes were observed in the lake's eastern embayment (e.g., east of Paoha Island).

Figure 4 of Jehl's testimony uses arrows to indicate the major distribution of phalaropes in 1980-1985 and in 1988-1992; the text implies that distributional maps are available for all years of his study, except for 1986 and 1987 when incomplete records were taken (page 39, paragraph 4). Despite several written requests, these additional data have not been made available to SWRCB consultants for review.

Although Figure 4 provides no data on numbers or specific locations of phalaropes in any year, it implies that this species was primarily in the eastern and northeastern sectors of Mono Lake since about 1988. Rubega's field notes confirm that both Wilson's and red-necked phalaropes have been restricted to these remote areas since at least 1989. Unlike the widespread use of the lake observed in most previous years, including 1981 and 1982, this restricted distributional pattern was predictable and consistent during the past 4 years.

The exact reasons for the recent distributional pattern of phalaropes at Mono Lake will not be known until long-term studies on their foraging behavior are conducted at higher lake elevations (e.g., above 6,376 feet msl). However, based on the best available scientific information, the draft EIR (page 3F-67, paragraph 2) concluded that the reasons for restricted phalarope distributions are probably related to the availability of free-floating alkali fly pupae and larvae, which tend to concentrate in the lake's northeastern sector where longshore currents converge (Stine pers. comm.). Further, the draft EIR concluded that phalaropes are attracted to this area because it provides the only consistently suitable foraging habitat remaining at lake elevations below about 6,376 feet msl.

Jehl proposed that the current phalarope distribution might be explained by greatly increased numbers of human visitors to Mono Lake (SWRCB Testimony of Dr. Joseph R. Jehl, Jr., page 46, paragraph 1). For example, he postulated that the large numbers of phalaropes he observed at South Tufa in the early 1980s may have abandoned this area due to harassment by tourists and their pets. Unleashed dogs often chase birds and can affect their feeding and roosting behavior in localized areas.

SWRCB consultants concur with Jehl that phalaropes might abandon a few specific areas if they were consistently disturbed there. However, phalaropes often permit humans to approach closely, and, when flushed, they usually fly short distances away and resume their previous activities. If phalaropes are frequently disturbed in specific areas, they probably would forage in nearshore waters rather than at the shoreline and would not abandon the area entirely.

Jehl's (1986b) 14 maps from 1981 and 1982 clearly indicated that he observed at least 1,000 or more red-necked phalaropes at many areas around the lakeshore, including County Park, Danburg Beach, DeChambeau embayment, Sulphur Springs, Warm Springs, Simon's Spring, South Tufa, Rush Creek delta, Lee Vining Creek delta, and the western shoreline. Increased tourism could not reasonably be assumed to cause phalaropes to avoid all of these historical foraging areas in favor of one restricted area in the lake's northeastern sector. Many historical foraging areas, such as DeChambeau embayment, Warm Springs, and Simon's Spring, continue to receive extremely low rates of human visitation and phalaropes have abandoned them, along with popular tourist spots such as South Tufa and the County Park.

As concluded in the draft EIR, phalaropes are probably restricted to the lake's northeastern sector because they cannot find suitable densities of alkali flies elsewhere. Other, unidentified, factors may also affect the distribution of phalaropes at Mono Lake; however, speculative comments regarding the effects of tourism are unconvincing and are unsupported by data.

## F5. California Gull-Nesting Capacity Estimates Were Incorrect and Misleading

### Summary of Comments

California gull-nesting capacity estimates in the draft EIR were based on incorrect assumptions and resulted in misleading conclusions about the future size of this colony at different lake elevations.

### Response

Detailed descriptions of the methods and assumptions used to calculate the potential California gull-nesting capacity were provided in the draft EIR (pages 3F-50 to 3F-53). Gull researchers on Negit Island (Winkler pers. comm.), the Negit Islets (Shuford pers. comm.), and the Paoha Islets (Jehl pers. comm.) were requested to provide maps of each island and to rank specific areas as high, moderate, or low according to their potential to support nesting gulls. As discussed below, however, different assumptions were used to calculate the maximum potential nesting capacities on Negit Island and the Negit Islets compared to those for the Paoha Islets.

Potential gull-nesting areas on Negit Island and the Negit Islets were identified based on detailed contour and habitat maps of each island and analyses of their nesting densities at specific locations observed in previous years. Shuford and Winkler (pers. comms.) recognized a gradient in gull-nesting habitat suitability and applied potential density estimates to each category rank to compensate for the gradient.

The Negit Island map (draft EIR, Figure 3F-2) was based on observations in 1976 (Winkler et al. 1977) and indicated historically occupied, low-gradient scrublands as high-suitability nesting habitats, while similar but historically unoccupied scrublands were considered moderate suitability; historically occupied white rocks areas (i.e., tufa-encrusted lava flows) were also mapped as moderate suitability. As noted in Appendix C (Table C-3), incomplete records were kept on the gull colony during 1977 and 1978 and coyotes first invaded the island in 1979. Subsequent land bridging and coyote predation events have made Negit Island unsuitable or low-suitability gull-nesting habitat in all following years (Appendix C, Table C-3).

Potential nesting capacity estimates for Negit Island presented in the draft EIR (Table 3F-5) assumed that the areas mapped as having high and moderate suitability would have a sufficient water barrier to remain predator free long enough to allow nesting gulls to successfully reestablish their former populations. If these conditions were met, Table 3F-5 indicates that Negit Island could potentially accommodate more than 120,000 gull nests if all suitable nesting habitats were occupied.

Based on the observations from all previous years, of course, Negit Island is unlikely to ever support this many nests. The draft EIR never stated or implied that these maximum nesting capacities would be achieved at Mono Lake. However, the calculated values provide evidence that long-term isolation of Negit Island would offer almost unlimited gull-nesting habitat in both scrub and white rock habitats.

As with Negit Island, maps of the Negit Islets reflected the relative potential for specific islets to support nesting gulls based on their topography and observed densities during the past decade. Nest counts for each islet varied in most years. However, high-suitability areas were usually characterized by gentle, tufa-encrusted slopes; moderate-suitability areas were sandy beaches lacking surface debris and steeper slopes; and low-suitability areas included steep, rocky slopes and water-proximate, wave-cut platforms (draft EIR page 3F-51, paragraph 5).

Based on detailed topographic maps and maximum 1992 nest counts from specific mapped habitats on the Negit Islets (Shuford pers. comm.), SWRCB consultants defined potential nesting capacities as: high = 1,300 nests per acre, moderate = 600 nests per acre, and low = 200 nests per acre (draft EIR, page 3F-52, paragraph 3). These categories reflect that variable habitat quality exists across the Negit Islets and not all areas are equally attractive to nesting gulls.

As noted in the draft EIR, the habitat suitability categories used in this analysis accurately predicted the maximum nesting densities of the Negit Islets observed in all previous years (page 3F-65, paragraph 4). Thus, the suitability categories used in the draft EIR continue to provide the best approximation for the maximum potential nesting capacity of the Negit Islets.

Jehl (pers. comm.) indicated that the potential nesting categories used for Negit Island and the Negit Islets could not be applied to the Paoha Islets (draft EIR, page 3F-52, paragraph 4). Based on his observations made at the Paoha Islets, and elsewhere throughout the breeding range of this species, he noted that similar maximum nesting densities have been observed on rugose and nonrugose substrates and all suitable habitats could potentially accommodate 1,000 nests per acre. As discussed in the draft EIR, however, such nesting densities are rarely achieved over large areas (e.g., 1 acre or more) because such concentrations often deplete local food supplies, attract predators, or promote the spread of disease (page 3F-65, paragraph 6).

A comparison of Dr. Jehl's map of rugose and nonrugose substrates at the Paoha Islets (draft EIR, Figure 3F-4) shows a strong correspondence with maps of gull-nesting areas reported there in the past decade (e.g., Jehl 1983, 1989, 1991 and 1992). On Coyote Islet, for example, rugose areas along the northern and eastern shoreline supported high densities of gull nests while large, sandy areas in the center and southern portions of the islet supported few, if any, nests. Similarly, areas mapped as rugose substrates on Browne, McPherson, Gull, and Anderson Islets were also used by nesting gulls, while open, sandy areas were generally avoided.

Due to variable density assumptions used by individual researchers, potential nesting capacities of the Paoha Islets were calculated using several different maximum values that yielded a wide range of results (draft EIR, page 3F-53, paragraph 1). A realistic system for categorizing Paoha Islet habitats would incorporate substrate type (i.e., rugose or nonrugose), degree of wave or wind exposure (i.e., protected or unprotected), and past history of use by nesting gulls.

A realistic classification system would not include historically unoccupied areas as prime nesting habitat and would result in a lower estimate of maximum nesting capacity for the Paoha Islets. For example, based on nest counts made in similar habitats on the Negit Islets, one could assume that rugose substrates support up to 1,300 nests per acre and nonrugose substrates support up to 200 nests per acre; this converts to a maximum nesting capacity of about 11,500 nests for the Paoha Islets compared to their highest count of 9,300 nests in 1992 (draft EIR, page 3F-65, paragraph 5). The sum of the highest ever counts for individual islets is about 12,000 nests, as derived from various reports by Jehl: Anderson (768), McPherson (3710), Whitney (43), Channel/Obsidian (81), Winkler (82), Dawson (227), Gull (1,416), Smith (149), Conway (43), Browne (1,531), Coyote (3,954), and Cluster (7).

Any habitat classification system is an oversimplification of nature and will never predict future events perfectly. However, even calculations using the most optimistic nest density assumption for the Paoha Islets (i.e., 19,000 nests at 1,000 nests per acre) revealed that they could not accommodate all of the gulls that would be displaced by land bridging of Negit Island and Twain, Java, and Pancake Islets under the 6,372-Ft Alternative, and periodically under the 6,377-Ft Alternative (draft EIR, page 3F-66). Thus, regardless of what maximum density is used, potential gull-nesting habitat at Mono Lake is predicted to be at a shortage without these historical nesting areas. Conversely, nesting habitat should be nonlimiting to future growth of the colony if Negit Island and the Negit Islets remain intact and predator free.

## F6. Paoha Island Was Not Identified as Potential California Gull-Nesting Habitat

### Summary of Comments

The potential importance of Paoha Island as a California gull-nesting habitat was not considered in the draft EIR. This island was used by nesting gulls historically and could provide important habitat for future expansion of the Mono Lake colony.

### Response

Paoha Island has not supported nesting California gulls for almost 70 years and thus was not considered potential habitat for this species in the draft EIR. The exact reasons for the gull's long-term avoidance of this island are unknown but may be related to the current existence of coyotes and severe dust storms there (Winkler pers. comm.).

Appendix C described the history of California gull nesting on Paoha Island during the early 1900s (page C-1). As summarized in Table C-1, Dixon (1916) observed about 2,000 nesting adults there and Dawson (1923) recorded about 1,700 gulls there in 1919. Gulls continued to nest on Paoha Island until sometime in the late 1920s when they abandoned it, possibly because humans, dogs, and goats were present on the island (McPherson pers. comm.).

About 200 gulls nested on Duck Islet (a peninsula of Paoha Island at lake elevations below 6,379.5 feet) in 1986 but not in subsequent years after it again became a peninsula (Table C-3); apparently a few pairs have attempted nesting on the island during the past decade, but none were successful because coyotes were present (Jehl pers. comm.).

When, or how, coyotes first arrived at Paoha Island is unknown, but a resident population has existed there since before 1980 (Winkler pers. comm.). Murphy (pers. comm.) observed a coyote swimming the narrow channel (i.e., about 1/2 mile wide) between Negit and Paoha Islands in 1990 (Appendix C, page C-12, paragraph 4), and other individuals may have followed this same route. The success of this island-hopping technique depends on the relative ease of access to Negit Island; if the land bridge is exposed, the entire trip would entail a short walk to Negit Peninsula and a short swim to Paoha Island. If coyotes were required to swim a long distance (i.e., a mile or more) to get to Negit Island, however, access to Paoha Island would become far more difficult.

The presence of small mammals and fresh water on the island provide favorable habitat conditions for coyotes and at least several individuals currently reside there (Jehl pers. comm.). Attempts to trap coyotes from Paoha Island during the mid-1980s were unsuccessful (Murphy pers. comm.), and future gull nesting there appears to be unlikely unless the coyotes are removed.

Since gulls last nested successfully on Paoha Island, Mono Lake's surface elevation has fallen by more than 50 vertical feet and its area has enlarged from 1,236 acres in the prediversion period to about 2,030 acres at the point-of-reference (draft EIR, page 3F-16, paragraph 5). Most of this exposed acreage is composed of unvegetated, or sparsely vegetated, lakebed sediments. The western shore of Paoha Island is one of the major sources of dust storms in Mono Basin (draft EIR, page 3H-21, paragraph 1). Gulls may prefer to nest on rocky substrates (i.e., like those on Negit Island and the Negit Islets and rugose areas on the Paoha Islets) to avoid exposing themselves and their chicks to frequent episodes of wind-blown dust.

Gulls might return to Paoha Island if resident coyotes, dust storms, and possibly other factors did not combine to make it an unfavorable nesting habitat. Intensive trapping efforts could probably remove the coyotes, but the dust storms would not cease until the lake's elevation increased to cover the recently exposed sediments. Unless these measures were taken, however, Paoha Island is unlikely to provide suitable nesting habitat for this species in the future.

## F7. The California Gull Impact Analysis Ignored the Point of Reference

### Summary of Comments

The draft shifted the 1989 point of reference to 1992. Higher numbers of gulls were observed in 1992, which allowed for the prediction of major adverse effects on the colony.

### Response

As shown in Appendix C (Table C-3), the Mono Lake colony consisted of about 44,000 nesting gulls at the 1989 point-of-reference. In subsequent years, however, the colony increased its numbers dramatically to about 61,500 adults in 1990, 65,000 adults in 1992, and 61,000 in 1993; the only exception to this increasing trend was in 1991 when only 43,500 adults were recorded.

The impact assessment for gulls was based on the predicted maximum potential for individual islets and islands to support nests at different lake elevations. This analysis could have been based exclusively on the point-of-reference population, without consideration of an observed population increase of more than 20,000 breeding adults. Had this been done, the nesting capacities of the Negit and Paoha Islets would have been based on the maximum populations observed up to 1989 and the extremely high populations recorded on these islets during three of the last four years would not have been considered.

Restricting the gull habitat analyses to 1989 conditions would have introduced a source of error regarding the elevations when Java and Twain Islets would be land bridged. Important research data from

1992 and 1993 indicate that coyotes can gain access to Java Islet at 6,375 feet, rather than at 6,373 feet, as predicted by the draft EIR (page 3F-19, paragraph 6). These new data clearly indicate that lake conditions under the 6,372-Ft Alternative would lead to effective land bridging and disruption of gull-nesting efforts more frequently than the 20% of the time as predicted by the draft EIR (page 3F-65, paragraph 2). Similarly, gulls likely would be slow to recolonize Twain and Java Islets if frequent coyote visitations occurred there (Shuford and Winkler pers. comm.).

Lakewide nesting capacities based on the highest gull densities up to 1989 point of reference would have resulted in the following assumptions and calculations for the 6,372-Ft Alternative: 1) Negit Island would be land bridged and unavailable for gull nesting; 2) land bridging of Twain Islet, Java Islet, and Pancake Islet would result in the displacement of up to 13,000 nests (i.e., the sum of the highest densities in all years before 1989); 3) the estimated capacity of all other Negit Islets would be about 12,500 nests (draft EIR page 3F-65, paragraph 4); 4) before 1989, the highest observed totals for the Negit Islets, other than Twain, Java, and Pancake, was about 7,500 nests, which would represent an unused capacity of about 5,000 nests and about 8,000 displaced nests; 5) the predicted capacity of the Paoha Islets would be about 8,000 nests, based on the highest total of 8,001 nests in 1983; 6) in 1986, the highest count through 1989, about 3,600 nests were counted on the Paoha Islets and the unused capacity of these islets would be about 4,400 nests; and, finally, 7) about 3,600 of the 8,000 nests displaced from Twain and Java Islets would not be accommodated on the Paoha Islets.

Thus, calculations based on point-of-reference and 1990 to 1992 populations both result in a prediction of significant impacts on nesting gulls under the 6,372-Ft Alternative. However, data collected in the early 1990s offer a more realistic view of maximum populations and potential impacts than do calculations based on a point in time that ignores important changes in the Mono Lake colony.

## F8. California Gull Nesting Preferences Were Not Correctly Identified

### Summary of Comments

California gulls at Mono Lake and elsewhere in their breeding range prefer to nest in entirely open habitats and avoid nesting on islands with shrubs. The prediction that gulls could have increased reproductive success in hot years in shaded greasewood habitat on Negit Island is unsubstantiated speculation.

### Response

Photographs presented to SWRCB by Dr. Joseph R. Jehl, Jr. clearly show California gulls nesting in unvegetated, or sparsely vegetated, habitats on the Paoha Islets, Mudbar Island and Farmington Bay at the Great Salt Lake, Utah; Honey Lake, California; and Bamforth Lake, Wyoming (LADWP Exhibits 81H, 81R, 81U, 81W, 81Y, and 81Z). Similarly, long-term studies of gulls nesting on the Paoha Islets suggest that they have high reproductive success on barren substrates (Jehl 1992).

Jehl's photographs also show gulls nesting near shrubs at Gunnison Island and Morton Salt Company at the Great Salt Lake, Brushy Island at Honey Lake, and Neponset Reservoir, Utah (LADWP Exhibits 81A, 81K, 81N, 81V). Similarly, photographs by Dawson (1923) and Fraser (NAS/MLC Hearing Testimony Exhibits) depicted California gulls nesting in greasewood habitats on Negit Island during 1919 and the mid-1930s, respectively. The overall impression gained by viewing these photographs is that California gulls are highly adaptable in their choice of nesting substrates.

Observations by early ornithological visitors to Mono Basin suggested that gulls preferred shade when it was available on secure nesting islands. In his May 27 and 28, 1916 field notes, Dixon (1916) recorded the following observations during a visit to the Paoha Island gull colony:

> Our next stop was at the *California Gull* rookery on the north side of Paoha Island. Two long ridges of black broken glass like obsidian rock extend out about two hundred yards towards Negit Island. . . . Gulls nest on both points (ridges), but mostly on the eastern one which is triangular and has a dense or rather vigorous growth of a thorny "arrowweed" like bush. The gulls nested on the shingle near the beach, under bushes, in holes and on the tops of the rocks. . . . The gulls seemed to realize the need of protecting their eggs from the boiling sun and often stood over the eggs shading them while they panted with open mouths.

On July 3, 1916, Dixon (1916) observed that:

> practically all of the gulls eggs had hatched and probably 30 percent of the young gulls were running about well feathered and nearly half grown. . . . I watched one with down still wet scramble about until she reached the shade of a sheltering rock. A few very young ones were found dead apparently from the heat as the sunlight is intense on the bare black rock upon which the eggs are often laid. . . . In one part of the rookery "hop" sage bushes were common. They stand about three feet high and are three or four feet across growing close to the [ground?]. . . . Holes under or in rocks were favorite hiding places for the young as they were well shaded and shade was much sought after by the young.

The Mono Lake gull colony expanded from about 2,000 adults in 1916 to about 51,000 adults in 1976 (Appendix C, Tables C-1, C-2 and C-3). The exact timing and rate of this dramatic population increase are unknown, but the increase occurred while the gulls nested primarily in greasewood scrub habitat on Negit Island.

When the island was first land bridged in 1979, however, approximately 25% of the Mono Lake colony shifted to the unvegetated Paoha Islets where they have continued to experience high reproductive success. Similarly, the unvegetated Negit Islets have supported nesting gulls since at least 1963 and they currently provide habitat for about 70 to 85% of the Mono Lake colony (Shuford pers. comm.).

Since 1979, Negit Island has not maintained a sufficient water barrier in most years to deter frequent coyote visitations and few gulls have nested there successfully (Appendix C, Table C-3). Thus, it has not been possible to observe whether gulls prefer to nest in open or shrub-dominated areas at Mono Lake when they were offered a choice of these habitats over a period of years. Long-term studies would be required to test this hypothesis and should focus on microhabitat selection and relative reproductive success on different islands and in open and shaded habitats.

Long-term reproductive data are lacking from shrub-dominated habitats on Negit Island; however, Winkler (1983b) suggested that a combination of heat stress and food shortages may have caused the extremely high rate of chick mortality observed on unshaded substrates of the Negit Islets in 1981. Heat stress may have been a factor in the low reproductive success observed on the Negit Islets in 1984 (Shuford et al. 1985), and Winkler (1983a) also found statistically significant correlations between chick mortalities and dates with high temperatures in previous years. These observations suggest that shaded habitats could increase chick survival rates, especially in extremely hot years like 1981 and 1984.

SWRCB consultants did not consider reported gull preferences for shaded or unshaded habitats crucial to the draft EIR's analyses of lake elevation alternatives. Under the 6,383.5-Ft Alternative, for example, Negit Island probably would be protected from coyote visitations and would offer an abundance of shaded and unshaded nesting habitat, including about 42 acres of greasewood scrub and 100 acres of scrub and open, white rock habitat (draft EIR, Table 3F-5). Similarly, the Negit Islets would provide about 27 acres of alternative, open habitat at this lake elevation.

About 14 acres of nesting habitat on the Paoha Islets would be lost to erosion, but the 6,383.5-Ft Alternative would result in a lakewide increase of almost 400% in total shaded and unshaded habitat, compared to point-of-reference conditions when Negit Island was land bridged (draft EIR, Table 3F-5). Therefore, the loss of unshaded habitats on the low-lying Paoha Islets was not predicted to have any significant adverse effects on the potential nesting capacity of gulls at Mono Lake. Furthermore, it should be noted that under LADWP's preferred alternative (SWRCB Hearing Testimony of William Hasencamp), the lake would rise to 6,385.5 feet msl and destroy the Paoha Islets.

## F9. Effects of Increased Lake Elevations on Caspian Terns Were Not Considered

### Summary of Comments

The adverse effects of increasing lake elevations on Caspian terns nesting on the Paoha Islets were not considered in the draft EIR's impact analyses. Failure to consider this species was a major flaw of the draft EIR.

### Response

Criteria for considering individual species in the impact analyses were summarized in the draft EIR (pages 3F-55 to 3F-57). Based on these criteria, species that required consideration were special-status species, including state- and federal-listed threatened and endangered animals, Category 1 or 2 candidates for federal listing under the federal Endangered Species Act, animals proposed for listing by the State of California, animals of special concern to DFG, and species listed as sensitive by local USFS and U.S. Bureau of Land Management regions (Appendix E, page E-1, paragraph 2). The impact analyses also included discussions of unprotected species that frequent Mono Lake in large numbers or that depend on it for the continued success of their regional, statewide, or global populations.

Caspian terns meet none of these criteria. They are not legally protected, or candidates for protection, by any state or federal law or agency. They are common at many coastal and interior locations across North America and in northern Europe, southern Asia, eastern China, the Persian Gulf, Australia, New Zealand, and along both coasts of Africa (draft EIR, page 3F-20, paragraph 4). Their population in western North America has increased in this century, especially at human-created habitats along the Pacific Coast (Gill and Mewaldt 1983).

The population size and nesting success of Caspian terns at Mono Lake were summarized by Jehl (SWRCB Testimony of Dr. Joseph R. Jehl, Jr., Table A). They nested on a high bench on Twain Islet (i.e., about 6,415 feet msl) from at least 1976 until 1979 when they abandoned this islet due to coyote predation (Winkler pers. comm.). Since 1982, up to 15 pairs have continued to nest at Mono Lake, principally on the Paoha Islets; reproductive success there has been low, ranging from 0 to 5 chicks fledged per year for the entire colony (draft EIR, page 3F-21, paragraph 3). Due to this poor reproductive success, Mono Lake's population of Caspian terns is probably sustained by immigration rather than by local reproduction (Jehl pers. comm.) and represents a minute fraction of this species' breeding population in western North America.

Caspian terns nest in dense colonies, and individual pairs defend about 15 square feet around their nests (Zeiner et al. 1990a). Therefore, only about 225 square feet would be required to accommodate the entire point-of-reference colony of 15 pairs.

In summary, Caspian terns were not considered in the draft EIR impact analyses because they lack legal protection or candidate status and because they are uncommon and unsuccessful at Mono Lake but abundant and successful at many other places in western North America and throughout their global range. Further, if their recent nesting habitat on the Paoha Islets were lost by increasing lake elevations, they could simply shift back to their previous nesting area on Twain Islet.

## F10. Eared Grebes Were Not Considered in the Impact Analysis

### Summary of Comments

Eared grebe populations were large and healthy at all lake elevations between 6,372 feet and 6,385 feet. Even during the lowest recorded lake elevations during 1980 and 1982, food was more than adequate to support the grebe population; this should have been considered in the impact analysis.

### Response

The draft EIR concluded that alkali fly and brine shrimp populations were sufficient to meet eared grebe foraging requirements at Mono Lake's historical low stand in 1982, at the 1989 point of reference, and through 1992 (page 3F-24, paragraph 3).

Because no adverse impacts on eared grebes have been observed at any historical lake elevation, SWRCB consultants assumed that food and habitat conditions would be suitable for this species under the 6,372-Foot Alternative and all higher lake levels.

Adverse impacts on eared grebes, and most other water birds, were considered under No-Restriction Alternative (draft EIR, page 3F-60, paragraph 1). Long-term management of the lake under this alternative, would result in a surface elevation of about 6,355 feet and salinity of abut 150 g/l (draft EIR, page 3F-59, paragraph 6). This value is near the upper limit for successful reproduction by alkali flies and brine shrimp and would result in dramatic reductions, or total elimination, of invertebrate prey and water bird predators from Mono Lake (draft EIR, page 3F-60, paragraph 1).

## F11. Effects of Lost Alkali Shoreline Habitat on Nesting Snowy Plovers Were Not Identified

### Summary of Comments

Large areas of alkali shoreline habitat along Mono Lake would be lost at higher lake elevations. This loss would have significant adverse effects on nesting snowy plovers.

## Response

Approximately 2,500 acres of alkali flat or barren habitats were required to support the 1988 population of 170 nesting pairs of snowy plovers (draft EIR, page 3F-34, paragraph 6). At the 1989 point-of-reference, about 10,000 acres of potentially suitable breeding habitat existed around the lakeshore, suggesting that more than 70% of the available habitat was not occupied by nesting snowy plovers.

All surface elevations above the 6,377-Foot Alternative would cause inundation of potential snowy plover breeding habitat, compared to point-of-reference conditions. However, more than 2,500 acres of barren habitats would exist around the lakeshore at all lake elevations except those of the No-Diversion Alternative (i.e., 6,425-6,430 feet msl) (draft EIR, page 3F-84, paragraph 3).

Although thousands of acres of alkali flats and other barren habitats would be inundated as the lake's elevation increased from 6,377 feet to 6,410 feet, the shoreline would become longer and former springs and seeps would likely reappear. These changes would benefit snowy plovers by increasing the size and productivity of their preferred wetland foraging areas (Page pers. comm.).

Based on the breeding and foraging requirements of snowy plovers, their populations are expected to remain at point-of-reference levels or to increase under all alternatives but the No-Diversion Alternative.

## F12. Benefits of Higher Lake Elevations to Water Birds Were Not Identified

### Summary of Comments

Extensive areas of saline, lake-fringing wetlands that would be lost at higher lake elevations (i.e., 6,390 feet and above) would be replaced by freshwater wetlands with higher value to ducks, shorebirds, and other migratory water birds.

## Response

Despite their large extent, alkali lakeshore, marsh, meadow, and scrub habitats that currently exist around Mono Lake support relatively few wildlife species (Appendix D, Table D-4). Wildlife use is probably low in these habitats because they lack any sources of freshwater. Under the 6,383.5-Foot alternative and higher lake levels, more than 55% of the lakeshore habitat would be inundated. Although it has low value, the loss of thousands of acres of habitat could result in significant impacts on wildlife that currently live there. (Not all of these habitats constitute jurisdictional wetlands under the Clean Water Act.)

As the lake's elevation increases, new freshwater wetlands would form at the creek deltas and at springs around the lakeshore (SWRCB Hearing Testimony of Dr. Scott Stine). However, these wetlands did not exist at the time of the 1991 field surveys conducted by SWRCB consultants (Appendix D), and they were not included in any of the analyses of wildlife habitat values (Appendix D, Table D-4).

Due to the lack of quantitative data from the prediversion years, changes in Mono Lake's avifauna due to elimination of freshwater sources around the lakeshore were discussed qualitatively for ducks, shorebirds, and other freshwater-dependent species in the draft EIR.

## F13. Impacts of Major Losses of Habitat on Bald Eagles, Willow Flycatchers, and Other Special-Status Species Were Not Identified

### Summary of Comments

LADWP water diversions caused major losses of lakeshore wetlands and tributary riparian habitats and resulted in significant, adverse impacts on bald eagles, willow flycatchers, and other special-status species populations. These impacts were not disclosed in the impact analyses.

### Response

As discussed in the draft EIR, diversion of Mono Lake's primary tributary streams, Lee Vining, Rush, Parker, and Walker Creeks, resulted in a loss of more than 200 acres of cottonwood-willow riparian habitat (draft EIR, page 3F-87, paragraph 4).

Since the draft EIR was prepared, SWRCB consultants have reviewed additional field notes taken by Joseph Dixon and Joseph Grinnell (available at the Museum of Vertebrate Zoology, University of California, Berkeley). Dixon (1916) observed and collected willow (Traill's) flycatchers in willow clumps around the lakeshore in May 1916. Similarly, Grinnell (1937) found this species to be fairly common in willows and swampy places around the lakeshore in June 1937.

Because breeding willow flycatchers are currently absent from Mono Basin, one might conclude that their decline was directly attributable to habitat losses caused by LADWP diversions. Reduced or discontinued streamflows and spring flows and channel incision caused by the diversions have reduced the quantity and quality of willow and meadow habitats associated with affected streams. However, approximately 500 acres of potentially suitable willow flycatcher breeding habitat continues to exist in Mono Basin (Appendix E, page E-17, paragraph 5), and the decline of this species is probably tied more directly to nest parasitism by brown-headed cowbirds (Sanders pers. comm.).

As noted in the draft EIR, fish comprise most of the bald eagles' diet (Appendix E, page E-5, paragraph 5). They also forage for injured or dead waterfowl, especially where large concentrations are present (Zeiner et al. 1990a). Thus, bald eagles likely were attracted by both the productive fisheries supported by Mono Lake's tributary streams and the large concentrations of waterfowl around the lakeshore. Reviews of prediversion references (e.g., Dixon 1916; Grinnell 1915, 1937; Dawson 1923; Grinnell and Storer 1924; Grinnell and Miller 1944), however, did not reveal any references to the occurrence of bald eagles in Mono Basin.

Gaines (1988) indicated that bald eagles concentrate at Lake Crowley reservoir and have been observed on lower Rush Creek. This is apparently the only published account of bald eagle occurrence in Mono Basin; without further supporting details their prediversion population status in Mono Basin cannot be assessed. For this reason, cumulative impacts on bald eagles were not described in the draft EIR.

## F14. The Wildlife Benefits of Increased Flows in the Upper Owens River Were Not Discussed

### Summary of Comments

Increased flows in the Upper Owens River resulted in the creation of wetland wildlife habitats that receive extensive use by waterfowl and shorebirds. These benefits to wildlife were not described in the draft EIR.

### Response

The draft EIR (page 3F-48, paragraph 5) concluded that increased flows in the Upper Owens River had not resulted in the creation of new wetland wildlife habitat. Rather, about 12.4 acres of willow scrub were lost during the diversion period, representing a 77% decline in the extent of this habitat since 1941. This decline in willow-scrub acreage has been attributed to increased soil saturation and bank collapse resulting from augmented flows downstream from East Portal (Stromberg and Patten 1991).

Cattle also reduced the extent of willow-scrub habitats by browsing foliage and by trampling moist areas near the river. Similarly, cattle-induced bank erosion is gradually reducing irrigated meadow habitats along the Upper Owens River (draft EIR, Chapter 3C).

Results of surveys conducted in spring and summer 1991 did not indicate that water bird use of the Upper Owens River was extensive. Forty-two bird and mammal species were observed during general and intensive surveys of willow-scrub and irrigated meadow habitats along this reach of the river (Appendix D, Table D-5). However, nesting waterfowl and shorebirds occurred in low numbers and Canada geese, mallards, cinnamon teal, American wigeon, gadwalls, American avocets, spotted sandpipers, and common snipe were the only species observed in the stream channel or adjacent irrigated meadows. Frequent disturbance by anglers and cattle, observed during the field surveys, probably reduce the value of these areas as waterfowl and shorebird nesting habitat (draft EIR, page 3F-48, paragraph 6).

In summary, the draft EIR did not emphasize the wildlife benefits of flow augmentations on the Upper Owens River because no benefits were identified. The acreage of willow-scrub and irrigated meadow habitats probably have been reduced or degraded during the diversion period and current use of this area by nesting ducks and shorebirds is low.

## F15. Benefits of New Wetland Wildlife Habitats Created by Lake Crowley Reservoir Were Not Discussed

### Summary of Comments

Wetlands along the western shoreline of Lake Crowley reservoir provide an extremely important habitat for shorebirds, ducks, and other water birds in the eastern Sierra. The benefits of new wetland wildlife habitats created by Lake Crowley reservoir were not discussed in the draft EIR.

### Response

These wetlands were not discussed in the draft EIR for the reason explained in response to Major Issue C1. Nonetheless, the following is an assessment of this issue.

LADWP staff reported that construction of Lake Crowley reservoir resulted in the creation of 916 new wetland acres with high wildlife value (SWRCB Hearing Testimony of Brian Tillemans). The existence and current wildlife values of these wetlands are not disputed; however, their relationships to prediversion wetlands in Long Valley are unclear.

SWRCB consultants were unable to find any detailed accounts of the prediversion wildlife habitat values of the Long Valley wetlands. Joseph Grinnell (1922) made passing reference to plants and animals he had seen while passing through this area on his way to Owens Lake in July 1922. In his account of the yellow rail, Dawson (1923) offered the following brief description of the Long Valley wetlands:

> A broad stretch of shallow water, say quarter of a mile wide and a mile long, is here fed by mountain springs, and bears a complete investiture of rank grasses or dwarf sedges, save where, centrally, it supports low beds of tules, or irrupts in pools so charged with mineral content that vegetation will not grow. Cattle tramp the edges in droves, but apparently avoid the central portion of the swamp because of its treacherous nature.

U.S. Geological Survey maps from 1899 to 1914 depicted between 2,000 and 2,400 acres of marshland in Long Valley; many of these areas were the same wetlands that currently exist along the western shoreline of Lake Crowley reservoir (SWRCB Hearing Testimony of Dr. Scott Stine). Without further descriptions of these seasonal and permanent wetlands before 1940, the beneficial and adverse impacts of constructing Lake Crowley reservoir cannot be evaluated. However, any comparison of current wildlife values around its lakeshore must also consider the adverse impacts of inundation of at least 2,000 acres of seasonal and permanent freshwater wetlands in Long Valley.

## LAND USE (G)

No major issues were identified.

## AIR QUALITY (H)

### H1. A Designated Regulatory Model Should Have Been Used

#### Summary of Comments

Two commenters (neither of which is a regulatory agency) stated that the draft EIR should have used an EPA designated regulatory model or that SWRCB should ignore the modeling results prepared for the draft EIR and rely on the modeling results produced by a study recently completed for the GBAPCD.

#### Response

In the interest of procedural consistency, EPA-designated regulatory models must be used for State Implementation Plan (SIP) documents and for most air quality permit applications. However, the EIR on the SWRCB's water rights action is not an air quality permit or a SIP document.

The Fugitive Dust Model (FDM) was used for the EIR analysis with the full knowledge and concurrence of all relevant air quality agencies. An EIR modeling protocol specifying the use of FDM was circulated to GBAPCD, the California Air Resources Board (CARB), and EPA for comment. After initially recommending the use of FDM, GBAPCD suggested that CARB and EPA be contacted directly to ensure that these agencies had no objections to FDM. CARB and EPA had no objections to the use of FDM; EPA Region 9 specifically stated that the draft EIR is not a SIP document or an air quality permit document and thus "the formal regulatory status of FDM is not an issue" (Bohnencamp pers. comm.).

EPA also noted its plan to replace the area source subroutines in its industrial source complex short-term (ISCST) model with a calculation procedure based on FDM. This planned future revision to ISCST was EPA's primary reason for not designating FDM as a formal regulatory model.

The EIR modeling protocol also was provided to the LADWP and Dr. Cahill of the University of California, Davis, for review and comment. Comments from LADWP's consultant and from Dr. Cahill were considered in designing the EIR modeling analyses. LADWP's consultant stated that FDM was an appropriate model to use. Dr. Cahill expressed reservations about the ability of any Gaussian dispersion model (such as the FDM and the ISCST model) to provide an adequate analysis.

SWRCB consultants selected FDM over ISCST for both technical and practical reasons (e.g., basic structure of the model, use of CARB settling and deposition algorithms, incorporation of wind-speed-dependent emission rate subroutines, and use of rectangular [as opposed to square] source area approximations). The FDM program code is primarily a merging of two EPA-designated regulatory models (CALINE3 and ISCST). Four model comparison studies conducted by TRC (including one study conducted specifically for Mono Basin under contract to GBAPCD) have each concluded that FDM performs somewhat better than ISCST as an area source model.

The air quality analysis presented in the draft EIR provide a fully adequate technical and legal foundation for SWRCB's actions.

## H2. Modeling Analyses Did Not Properly Characterize Emission Sources

### Summary of Comments

One commenter questioned several technical aspects of the air quality modeling studies performed for the draft EIR, focusing on issues related to proper emission source characterization. In particular, modeling results presented in the draft EIR were questioned with respect to:

- delineation of source areas and the assumption of uniform emission rates within delineated areas,
- the lack of sensitivity testing for particle characteristics derived from literature data,
- the mathematical form of the emission rate equations,

# an alleged failure to account for lake fluctuations at dynamic equilibrium, and

# additional uncertainty posed by newly released portable wind tunnel study data.

**Response**

The air quality modeling analyses presented in the draft EIR recognized that source area delineation and emission rate equations must be linked because available information does not allow a simulation of the spatial and temporal variation in emission rates within areas mapped as a common source category. This issue was addressed by careful delineation of the source area to distinguish source characteristics wherever possible and by selection of emission rate equations that generate emission rates well below peak emission rates.

The draft EIR modeling analysis separated emission source areas into seven source types having different emission characteristics: three subcategories of terrestrial high emission rate areas, three subcategories of terrestrial low emission rate areas, and the lake surface. The various source area categories were differentiated by combinations of basic emission rate equation format, threshold wind speed value, particle density, and mass distribution among PM10 size classes.

The draft EIR modeling analyses were prepared for impact assessment purposes, not for academic model sensitivity evaluation purposes. Parameter values were established only after careful analysis of available data. The literature data used represent real data from real measurements.

Particle densities reported by a wide range of sources are remarkably uniform and well established. The particle densities used in the draft EIR modeling analyses are based on careful consideration of the substrate mixtures expected in the different emission source categories. The threshold wind velocities used in the draft EIR analysis are entirely consistent with direct measurements reported by GBAPCD. Most emission rate equations were likewise derived from available data. The low emission rate terrestrial source area equations are the only emission rate equations not derived from directly measured data, and these equations were tested to ensure that these areas would not inordinately influence modeling results.

There is no need to arbitrarily modify the parameter values used in the draft EIR analysis just to see how different the results would be if unrealistic parameter values were used.

The modeling analyses presented in the draft EIR were designed to estimate potential 24-hour average PM10 concentrations under conditions conducive to wind erosion. The assumption of active source areas is logical in the context of the draft EIR modeling analyses. These analyses were designed using reasonable combinations of source area delineation and emission rate characteristics. The active source area assumption would be less reasonable if the analyses were designed to calculate annual average concentrations, but the draft EIR analyses focused on 24-hour average concentrations.

The draft EIR balanced emission rate equations with procedures used to delineate source areas so as to avoid seriously over estimation of PM10 concentrations. Detailed modeling results presented in Auxiliary Report 26 demonstrate that the draft EIR does not over estimate peak PM10 events at the Simis Ranch monitoring site.

Modeling results were directly used only to estimate potential PM10 concentrations under conditions that would be prone to wind erosion. Independent analyses were performed to assess the realistic frequency with which air quality standards might be exceeded at different lake levels.

The proper way to compare the emission rate equations used for the draft EIR and the 1993 GBAPCD modeling study is to examine their ability to fit the actual monitoring data from which both equations were derived. The draft EIR sigmoidal equation provides a superior fit to the underlying data.

The draft EIR assessment explicitly recognizes the lake level fluctuations inherent in each alternative. Individual model runs necessarily assessed discrete lake elevations, but eight discrete lake levels were modeled to allow analysis of fluctuating lake levels. The results of discrete model runs are presented in Table 3H-7 of the draft EIR, but the narrative discussion of impacts associated with each alternative explicitly reflects the range of lake levels anticipated under dynamic equilibrium conditions. Conditions during the transition to dynamic equilibrium are easily reviewed by reference to model results for intermediate lake levels (refer to Table 3H-7 of the draft EIR). Impact characterizations presented in Table 3H-6 of the draft EIR reflect lake level fluctuations under dynamic equilibrium conditions.

The new wind tunnel data released by GBAPCD indicate that peak emission rates can be an order of magnitude higher than the rates measured during the 1990 tests used for the draft EIR analysis. The 1990 emission rate data used in the draft EIR were clearly much lower than maximum short-term emission rates, and this fact was recognized in designing the draft EIR analysis.

The new emission rate data will provide a basis for further refinement of any modeling analyses conducted in the future. The same considerations used to design the draft EIR analysis should be applied in any future modeling analyses using the new emission rate data. In particular, development of emission rate equations must be balanced by consideration of the manner in which emission source areas will be delineated. Maximum emission rate data should be used only if more refined procedures are applied to the issue of source area delineation.

## H3. Modeling Analyses Did Not Address the Potential for New Salt Deposit Formation at Higher Lake Levels

### Summary of Comments

One commenter suggested that rising lake levels may generate new efflorescent salt deposits in areas where there is little or no efflorescence today, resulting in no change in the frequency of dust episodes.

### Response

The potential for changes in salt deposits in response to rising lake levels was investigated as an essential element of the draft EIR air quality modeling analyses. No direct or circumstantial evidence was found to support the speculation presented in this comment. More importantly, no mechanism has been identified that could produce meaningful expansion of salt deposits into new areas as the lake level rises.

There is no evidence that major efflorescent salt deposits existed at Mono Lake until after the lake level dropped significantly. The groundwater table slopes toward Mono Lake, not away from it. Mono Lake is a terminal lake for both surface water and groundwater. The horizontal and vertical extent of efflorescent salt deposits away from the Mono Lake shoreline indicates that direct percolation of lake water is a very unlikely source of most of the efflorescent salts. Available evidence (see Appendix U of the draft EIR) clearly points to groundwater as the direct source of efflorescent salt deposits, except those deposits in the immediate vicinity of the shoreline. Absence of efflorescent salt deposits in the prediversion period provide the primary basis for the draft EIR assumption that salt deposits would not expand as lake levels rise.

## H4. The EIR Should Include a Comparative Summary of Results from the 1991 and 1993 Modeling Analyses Conducted for GBAPCD

### Summary of Comments

One commenter believed that the draft EIR did not adequately summarize results from a 1991 model comparison study performed by TRC for GBAPCD. Some commenters suggested that the EIR should present a summary of results from a 1993 modeling analysis conducted for GBAPCD, either as a comparison to draft EIR modeling results or as a replacement for the draft EIR modeling analyses. One commenter believed that the EIR should discuss technical differences between the draft EIR and 1993 GBAPCD modeling analyses.

### Response

The 1991 TRC study was reviewed during preparation of the draft EIR but provided no new data useful for the EIR air quality analysis. The 1991 study was designed for comparative evaluation of the FDM and ISCST models and recommended that future modeling studies use the FDM model. (The 1991 model comparison study was one of the factors used in selecting FDM as the model to use for the draft EIR air quality analysis. Refer to the response to Comment H1.)

The results of the 1993 GBAPCD modeling study, which used ISC2, an updated version of ISCST, were received too late for inclusion in the draft EIR. However, a preliminary comparison of modeling results from the FDM and ISC2 studies suggests that the draft EIR FDM analysis more accurately replicated monitored PM10 values at Simis Ranch and Cedar Hill, while the ISC2 analysis more accurately replicated monitored PM10 values at Warm Springs. A detailed summary of the 1993 GBAPCD study is not necessary because GBAPCD concludes that both the draft EIR and the APCD modeling analyses support similar conclusions (Comment Letter No. 13). As noted in response to Comment H1, the draft EIR air quality modeling analyzed provide a fully adequate technical and legal foundation for SWRCB's actions.

The draft EIR analysis used FDM, a technically more refined model, and more refined input data and assumptions than those used for the ISC2 modeling study. Use of the FDM had the following advantages:

- the FDM particle settling and deposition algorithms are generally acknowledged to be superior to the ISC2 settling and deposition rate algorithms,
- the draft EIR emission rate algorithm provided a better fit to available wind tunnel data than did the algorithm used in the ISC2 study,
- the draft EIR delineation of source areas was more refined than the source area delineation used for the ISC2 study, and
- the draft EIR source characterizations (i.e., particle size classes, mass distributions, and particle densities) were more refined than those used for the ISC2 study.

## H5. The Draft EIR Does Not Address Health Risks Associated with the Arsenic Content of PM10 in Mono Basin

### Summary of Comments

One commenter noted that the draft EIR did not discuss the implications of the arsenic content of efflorescent salt deposits. This comment has been interpreted as referring to health risks.

### Response

Arsenic exposure associated with Mono Basin PM10 concentrations was mentioned but not discussed in detail in the draft EIR for three reasons:

- there is no evidence that the arsenic content of PM10 samples poses any significant direct toxicity risk,
- evidence presented in previous court testimony indicates that the cancer risk from airborne arsenic exposure in Mono Basin is low, and
- available data do not allow an accurate comparative assessment of alternative lake levels in terms of arsenic exposure and associated cancer risk.

Available data allow a generalized assessment of the cancer risk associated with historical total suspended particulates (TSP) and PM10 concentrations along the north and east shores of Mono Lake, but do not provide a reliable basis for extrapolating this information for the south and west shores of the lake or for the future at altered lake levels. (Available data come from analysis of 40 particulate matter samples collected at various locations over a 10-year period.) Although arsenic has been detected in historical TSP and PM10 samples from the north and west shores of Mono Lake, the substrate components that are the source of this arsenic have not been identified.

Historical TSP samples (14 samples between 1979 and 1982 from Binderup, Hansen Ranch, and Simis Ranch) had a mean arsenic content of 37.64 parts per million by weight (ppmw). More recent PM10 samples (26 samples between 1987 and 1990 from Simis Ranch, Warm Springs, and Cedar Hill) had a mean arsenic content of 31.64 ppmw. The arsenic content of individual TSP and PM10 samples spans a range of less than 7 ppmw to more than 87 ppmw, indicating that the arsenic content of contributing substrates is not uniform. Both the lowest and highest arsenic fractions were found in PM10 samples from Simis Ranch. The analyzed TSP and PM10 samples are significantly biased toward higher TSP and PM10 concentrations and may not be representative of annual average exposure values.

Neither the TSP nor the PM10 samples exhibit any correlation between particulate matter concentration and arsenic content. The only geographic pattern suggested by the available data is that TSP sources affecting Hansen Ranch have a lower arsenic content (18 ppmw) than the TSP and PM10 sources affecting Binderup, Simis Ranch, Warm Springs, and Cedar Hill. However, this apparent geographic pattern could be attributable to limited data because only two TSP samples from Hansen Ranch were analyzed.

Available data do not demonstrate that terrestrial substrates are the dominant source of the arsenic found in TSP and PM10 samples. Any analysis of cancer risk from airborne arsenic must examine the importance of spray aerosols from Mono Lake. Available data indicate that dissolved solids in the water of Mono Lake have an arsenic content of 170 ppmw (see Table 3B-2 in the draft EIR). The high arsenic content of Mono Lake water indicates that lake spray may be the dominant source of measured PM10 arsenic whenever spray aerosols contribute 10% or more to the total PM10 mass. Lake spray aerosols accounted for 10% or more of the total PM10 mass in the Simis Ranch area on 28 of the 50 days modeled for the draft EIR air quality analysis.

Because altered lake levels will be associated with altered source area contributions to ambient PM10, historical data are not a reliable basis for assessing the cancer risk associated with PM10 exposure for the different lake level alternatives.

Supplemental analyses have been prepared to verify the low risk associated with recent airborne arsenic exposures on the north and east side of Mono Lake. These supplemental analyses assume an average arsenic content of 34 ppmw for PM10 in the vicinity of Simis Ranch. The analyses used the current lifetime exposure unit risk factor for inhaled arsenic (a cancer risk of 0.33% [3,300 chances per million] for a 70-year exposure to an average inhalable arsenic concentration of 1 microgram per cubic meter).

The documented arsenic content of historical PM10 and TSP samples represents only a trivial cancer risk for visitors to the scenic area: 38 chances in 1 billion for visitors spending a lifetime cumulative total of 2,400 hours (100 days) along the north and east shores of Mono Lake at PM10 exposures averaging 86.5 micrograms per cubic meter over the 100 days. There is a low risk from airborne arsenic exposure for residents in the Simis Ranch vicinity: 1.68 chances in 1 million for a 70-year exposure to PM10 concentrations averaging 14.96 micrograms per cubic meter (the arithmetic average of all reported Simis Ranch PM10 samples collected from October 1986 through June 1992).

## H6. The Draft EIR Does Not Adequately Discuss the Full Range of Health and Ecosystem Effects Associated with High PM10 Concentrations

### Summary of Comments

One commenter believed that the draft EIR did not adequately discuss the air quality aspects of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. This commenter made reference to long-term public health risks and the uniqueness of the Mono Lake ecosystem. Another commenter noted that the draft EIR failed to address air quality, particle saltation, and dune activation impacts on upland vegetation. A third commenter noted that the draft EIR did not discuss the traffic safety hazards associated with dust storms.

### Response

As noted in the draft EIR, available physical and chemical characterizations of Mono Basin PM10 are not detailed enough to allow an analysis of specific health effects. Consequently, the draft EIR used the health-based state and federal air quality standards as indicators of potential short-term and long-term health effects. Short-term health effects are addressed according to the 24-hour average PM10 standards, and long-term health effects are addressed according to the annual average PM10 standards.

The state and federal standards that address acute health effects are the 24-hour PM10 standards. Both the state and federal 24-hour average PM10 standards are periodically violated in various portions of Mono Basin. Individuals exposed during these violations are likely to experience acute respiratory irritation; significant eye irritation is also possible, especially when efflorescent salt particles are a significant component of PM10. Significant respiratory symptoms have been reported from persons living in communities exposed to dust storms originating from Owens Lake (Saint-Amand et al. 1986).

The state and federal standards address chronic health effects through the annual average PM10 standards. As noted in the draft EIR, annual average PM10 values in Mono Basin are among the lowest in California, which indicates a low risk of long-term health effects. Although repeated short-term exposure might aggravate an individual's preexisting chronic respiratory problems, there is no reason to expect it would be a primary cause of those problems.

Long-term cancer risks associated with the arsenic content of PM10 in Mono Basin are addressed in response to comment H5. As indicated in that response, available data do not indicate a high arsenic-related cancer risk from Mono Basin PM10.

Dust storms in Mono Basin are expected to produce short-term respiratory and eye irritation problems, but available data do not support any indication of significant long-term health effects. The draft

EIR recognizes that short-term respiratory and eye irritation problems represent a significant air quality impact.

There is no evidence that episodic dust storms have measurably constrained either short-term uses of the resources in Mono Basin or long-term productivity of Mono Basin ecosystems. It is reasonable to assume that dust storms have short-term impacts on exposed wildlife and vegetation (e.g., gull chicks on Paoha Islet), but the magnitude and extent of these impacts are unknown. Available data provide no basis for assuming that dust storms are producing significant long-term impacts on Mono Basin ecosystems.

Deposition of alkaline dust on vegetation probably has short-term effects on the palatability of the affected vegetation for wildlife and livestock, but the SWRCB consultants are not aware of any studies providing either a quantitative or a qualitative assessment of this effect. Individual dust storms undoubtedly have short-term respiratory effects on wildlife and livestock, but there are no data on the magnitude of these effects. Deposition of alkaline dust may be affecting vegetation growth rates in some locations, but no studies or data confirm such an effect or assess its significance. Likewise, there are no data on long-term physiological effects on wildlife or livestock.

The draft EIR notes that efflorescent salt deposits preclude vegetation establishment on the affected lakebed sediments. The alkalinity and salinity effects of salt deposits are compounded by the salinity, alkalinity, and mineral content of shallow groundwater. Available data are not sufficient to assess the extent to which downwind alkaline dust deposition produces an ecologically significant alteration in the chemistry of affected Mono Basin soils or shallow groundwater.

As noted in the draft EIR, barren substrates exposed by the lowering of Mono Lake are subject to wind erosion. Particle movement during wind erosion occurs by surface creep, saltation, and suspension transport of particles, with eventual deposition of the particles in downwind areas. Surface creep and saltation typically account for most of the soil or sediment mass moved during the wind erosion process. Particles moved by surface creep and saltation tend to be deposited relatively close to the original source area. Deposition is most pronounced around vegetation, rocks, surface irregularities, and structural features such as fences and buildings.

The draft EIR did not discuss vegetation impacts resulting from abrasion by windblown sand or plant burial by deposited sand and silt. No specific investigation of these processes was performed during the preparation of the draft EIR, and field studies conducted for other purposes did not identify sand abrasion damage or plant burial as issues of significant concern.

Plants growing downwind of the barren substrates that have been exposed by the lowered lake level are undoubtedly being damaged by abrasion and buried under sand and silt. The magnitude and geographic extent of these impacts were not evaluated during preparation of the draft EIR. Information on these issues will become available in the future as ongoing research is completed. The extent and magnitude of these impacts will be reduced by alternatives that result in higher lake levels.

The commenter raising the issue of traffic safety hazards from dust storms claims to have been escorted by California Highway Patrol along U.S. 395 during a major dust storm. The commenter may have confused Owens Lake with Mono Lake. The dust storms at Mono Lake only affect county roads or unimproved roads in remote areas north, northeast, and east of Mono Lake.

## H7. Air Quality Mitigation Measures Are Not Adequately Addressed

### Summary of Comments

One commenter believed that the EIR should discuss the feasibility of air quality mitigation measures that are being considered in Owens Valley.

### Response

Most mitigation measures that have been suggested for the Owens Lake area have already proven to be ineffective or infeasible there and would be even less feasible at Mono Lake because of scenic area restrictions. Measures that have been considered and rejected at Owens Lake include compaction of the surface of emission source areas; application of stabilizing chemicals; and installation of single sand fences, sprinkler irrigation, and tree plantings. Studies at Mono Lake have determined that revegetation with grasses or shrubs is infeasible. Other mitigation measures still under consideration for the Owens Lake area (e.g., multiple sand fences and gravel spreading) are in conflict with current scenic area restrictions at Mono Lake. In addition to the conflict with scenic area restrictions, the gravel spreading measure is of dubious economic feasibility and entails significant environmental impacts related to mining and material transport.

Flood irrigation has been suggested as a mitigation measure for Owens Lake; raising the level of the lake is the practical equivalent of flood irrigation at Mono Lake.

Both GBAPCD and the USFS have submitted comments concurring with the draft EIR evaluation that no feasible air quality mitigation measures have been identified.

List of Acros



List of Refs

List of Hearing Info.



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