Comments of the Sierra Club and Los Osos Sustainability Group on development of the Basin Plan for the Los Osos Groundwater Basin

Sierra Club is a California non-profit membership organization concerned with the protection of the environment and public health. Members of the Sierra Club reside throughout the town of Los Osos and the Prohibition Zone, and have a long history of involvement in water quality and treatment issues directly pertaining to the sustainability of the Los Osos Groundwater Basin, a resource vital to the people and economy of the Los Osos community and to the health and sustainability of the Morro Bay National Estuary and the State Marine Reserve.

Los Osos Sustainability Group (LOSG) is comprised of homeowners in the Los Osos Basin who assert that the present Basin Plan does not protect their rights to the beneficial use of the Basin, their sole water source, because it does not maximize the seawater intrusion mitigation programs the Basin Plan identifies for stopping and reversing seawater intrusion. Fully maximizing measures to mitigate seawater intrusion is required by the Coastal Development Permit issued for the Los Osos Wastewater Treatment Plant.

On August 11, 2014, the Sierra Club submitted a letter to the Board of Supervisors of the County of San Luis Obispo, Central Coast Regional Water Quality Control Board, Golden State Water Company, Los Osos Community Services District and S & T Mutual Water Co. detailing the need for improvements in the Basin Plan's primary seawater intrusion mitigation programs (conservation, recycled water and infrastructure),among other improvements (see Exhibit 8). The Parties did not respond, nor did they implement any of these recommendations in the final draft of the Plan to be submitted for Court approval in August.

The LOSG asserts that the Basin Plan increases the likelihood that their water and wastewater will become unaffordable insofar as it will likely result in the loss of the Basin to seawater intrusion, requiring the community to fund a large desalination facility. The Basin Plan estimates the cost for such a facility at over $100 million (see Page 3). Given water shortages in the area and throughout the state, imported water is not likely to be available or technically feasible.

The Los Osos Basin is one of the most endangered Basins in the state. It is designated a "high priority" Basin in the Sustainable Groundwater Management Act. It is facing the state's worst drought on record, at a time when the Basin is also about to undergo changes that will bring about major hydrological disruptions with unknown and possibly devastating consequences.

Forty years of severe overdraft due to the absence of management has resulted in seawater rapidly replacing freshwater in the Basin. In 2014 the advance of seawater intrusion was found to have accelerated to 250 feet per year in the main drinking water aquifer (3-4 times the former rate). In the large, deep aquifer, which has been largely abandoned to seawater intrusion, the estimated rate is about 170 feet per year since 1977 (see Pages 86-90). The Basin Plan estimates that about 90% of the freshwater in the Basin is below the level needed to hold back seawater intrusion (Page 91).

This severe seawater intrusion is occurring at the same time that Basin water levels are being adversely impacted by the worst drought on state record, which has reduced rainfall to about 45% of normal for the past three years (about 8 inches, rather than about 17 inches), with a similar drop in recharge (virtually all Basin recharge is from rain). The Basin is also about to undergo major hydrological disruptions with the implementation of the Los Osos Wastewater Project (LOWWP), which will replace the dispersed return flows from about 4500 septic leach fields (about 750 AFY of water) with 481 AFY of recycled water discharged primarily in one location (450 AFY in Broderson leach field). Basin hydrology will also undergo major impacts from a substantial redistribution of pumping proposed in the Basin Plan, Infrastructure Programs A through D. Programs A and C are recommended for implementation with the current population, and Programs B and D support a build out population.

Agencies and experts have recognized the potential for significant adverse impacts from these projects (especially in combination) on seawater intrusion and sensitive habitat. Agencies and experts also recognize the potential for adverse impacts from drought and climate change. However, the Basin Plan does not address these impacts.

We concur with the Basin Plan's assessment that conservation, recycled water use, and certain infrastructure programs are the quickest and most cost-effective ways to achieve Basin sustainability. However, the evidence we provide clearly shows the Basin Plan does not fully develop their benefits, nor comply with governmental mandates to maximize conservation and the recycled water program to preserve limited water resources. Further, it does not utilize reasonably prudent management strategies and tools to preserve the resource.

We explain herein how the Plan does not maximize its main mitigation programs, comply with governmental mandates, address major adverse impacts and related uncertainties, consider expert opinions, provide enforceable objectives to ensure quick implementation, provide adequate adaptive measures, nor use sufficiently prudent management strategies and tools (including yield estimates) to preserve the Basin.

Finally, we provide improvements to the Basin Plan that will allow it to comply with governmental mandates and to optimize the potential for Basin sustainability, as well as the sustainability of environmental, human, and economic resources that depend on it.

We consider these changes to be vital to Basin sustainability, and request that they be incorporated into the Basin Plan and that the revised Basin Plan be made available to us before it is submitted to the Court.

Basin conditions—why a strong Basin management plan is urgently needed.

The Basin is the sole source of water for the Community of Los Osos and area farms. It is also a main source of freshwater flows supporting high-value Morro Bay National Estuary habitat in the area. The State has designated it a "high-priority" basin via the Sustainable Groundwater Management Act for its value and the threat it faces. The Basin is being rapidly destroyed by severe seawater intrusion, raising the real possibility of losing the resource. Seawater intrusion into the Basin has gone unabated for 40 years due to the absence of any Basin management and continued severe overdraft (30 to 60% annually, assuming normal rainfall). The Basin Plan reports (based on a 2014 technical memorandum by Cleath-Harris Geologists, Inc.) that the rate of intrusion through the main drinking water aquifer (Zone D) accelerated to 250 feet per year (three to four times its previously assessed rate) since 2005 despite a substantial reduction in pumping since 2000. The seawater front had reached Broderson Avenue in Zone D and the Commercial District in Zone E, the large deep aquifer (see Pages 87-90).

Thus, by early 2014, seawater had contaminated much, possibly most, of the Basin, destroyed much of it, and was accelerating—and the 2014 technical memorandum does not show the full adverse effects of the drought (the most severe on record), which likely will take many years to fully manifest. The Basin Plan does not say how much of the Basin's capacity has been lost, but it indicates that about 90% is below the level needed to hold back seawater intrusion (Page 91). Prior to the recent drought, an expert on the Los Osos Basin called the seawater intrusion problem "extremely urgent," pointing out that seawater intrusion is very difficult to reverse and remediate, also citing the impending potential adverse impacts of the LOWWP. (See Exhibit 1, Pages 4 & 5, and Exhibit 2, Pages 1 & 2).

The Parties recognize the need for "bold, decisive, and immediate action" (see Basin Plan, Page 1). However, the Basin Plan does not provide it. It does not maximize the three main mitigation programs it recommends nor take other reasonable actions to prioritize and maximize Basin sustainability.

The Plan does not maximize the seawater intrusion mitigation programs it proposes nor

comply with related governmental mandates.

The Basin Plan makes the conservation program (referred to in the Basin Plan as the "Urban Water Use Efficiency Program") the "highest priority program…for balancing the Basin and preventing further seawater intrusion," yet it does not maximize the program (see Page 142). It adopts the LOWWP conservation program (which applies to 90% of the community) and it proposes that the County extend the program Basin-wide, adding outdoor measures (see Page 198). It also proposes that the County administer the program until 2018 (Page 198).

The LOWWP Coastal Development Permit (CDP) requires the LOWWP program "to help Basin residents to reduce potable water use as much as possible," and it requires the County to spend $5 million "to initiate the program as soon as possible after project approval." It also states that measures shall not be limited to "retrofits and low water use fixtures and grey water systems" (See Exhibit 11, Special Condition 5b). However, the LOWWP program the County implemented over two years ago is basically a limited indoor retrofit program focusing on toilet, showerhead, and faucet aerator retrofits. The program has fallen well short of the targets the County set for these measures in its implementation plan, and the program includes no grey water systems or other outdoor measures.

The LOWWP (Basin Plan) program is based on a plan developed for the Parties by Maddaus Water Management (MWM), which does not maximize indoor measures and has a very limited outdoor program. Like the MWM plan, the Basin Plan recommends against including grey water reuse, rainwater reuse, and turf replacement in the program, although both plans recognize the benefits and encourage individual property owners to implement the measures (see Basin Plan, Page 188 & 189). The Basin Plan program also does not include low water use landscaping although the Pacific Institute points out that the measure can reduce outdoor water use by more than 70% (see Exhibit 10, Page 3). Peter Mayer, a nationally-recognized expert, confirms that the MWM conservation program (the basis for the LOWWP and Basin Plan programs) does not maximize cost-effective indoor and outdoor measures to reduce water use and seawater intrusion as much as possible pursuant to the LOWWP CDP (see Exhibit 5.)

Thus, the Basin Plan program does not comply with the LOWWP Coastal Development Permit (CDP). The CDP requires the program "to help Basin residents to reduce their potable water use as much as possible" (see Exhibit 11). However, a water rate study completed by the LOCSD in December 2014 shows Los Osos residential use is about 75 gpcd indoors and outdoors, and recent State data show several California communities are under 55 gpcd. Santa Cruz and Santa Rosa water use is 46 gpcd and 49 gpcd respectively (see Exhibit 7, Page 4). Therefore, conservation offers much more potential

to reduce production and seawater intrusion in the Basin. A 25% reduction in urban use would result in 400 AFY less production, substantially increasing Basin sustainability. Data indicate that a 30% reduction may be possible with conservation.

Governor Brown's Executive Order B-29-15, designed to maximize conservation in response to the continuing drought, requires a 25% reduction in 2013 urban water use state-wide by February 28, 2016 (see Exhibit 9, e.g., Directive 2.) While the SWRCB is still developing the framework for this regulation, it is clear the Basin Plan is not consistent with this order.

For the Basin Plan to reduce 2013 urban production (1670 AFY) by 25%, it would have to reduce use to about 1250 AFY by next year. The Basin Plan's goal is to reduce urban use to 1450 AFY by 2035 (see Basin Plan, Pages 142). A SWRCB Fact Sheet on the Order states that urban water suppliers serving fewer than 3000 connections (i.e., three of the Parties) will either have to achieve the 25% reduction or restrict outdoor water use to no more than two days per week. In either case, the Basin Plan does not comply with the order because it does not commit the Parties to the 25% reduction or the outdoor restriction (which would likely require an ordinance). The Basin Plan does not propose using ordinances to implement programs and achieve goals (which is another problem with the Plan—see discussion below).

The Governor's Order also requires that the State Model Efficient Landscape Ordinance is updated to require districts to meet increased outdoor efficiency standards for existing landscapes—specifically mentioning the use of such measures as grey water reuse, rainwater catchment, and turf replacement. As mentioned, the Basin Plan recommends against including grey water reuse, rainwater catchment, and turf replacement in its conservation program (see Exhibit 9, Directive 8).

There is clearly a good deal of potential to reduce production and increase Basin sustainability with a stronger Basin Plan conservation program. Both the CDP and recent drought regulations require it (see earlier submittals for specific measures the program can implement to increase benefits).

Although the Basin Plan adopts the LOWWP recycled water program (the "Water Reinvestment Program"), it does not include improvements to the program that help preserve the Basin. The LOWWP program currently commits a significant portion of the recycled water for the conversion of dry land farming to irrigated farming, a use that provides no solution to seawater intrusion. It also fails to maximize urban reuse, which provides the greatest seawater intrusion mitigation benefit, according to the LOWWP EIR and *Fine Screening Report,* (see Exhibit 4). The Basin Plan further fails to maximize the "Basin Infrastructure Program." It recommends that Programs A and C be

implemented to support the current population, which move more production to the Upper Aquifer and inland. However, it does not recommend Program D, one of the most cost-effective measures, except to support the build out population. Program D is also needed to support the current population. We do not support implementing Program B without further analysis as to its costs versus risks and benefits. The analysis should consider the potential adverse impacts to the Upper Aquifer we cite below.

The Plan does not address major adverse impacts on the Basin.

The Basin Plan does not discuss nor account for several major impacts on groundwater levels and seawater intrusion, which can severely harm the Basin and possibly destroy it, especially in combination. These must be adequately addressed with mitigation programs and adaptive management.

Drought Impacts: The present California drought is the state's worst on record and has resulted in rainfall levels in Los Osos for the past four years that are about 45% of normal. The average rainfall for the area had been about 17 inches prior to 2005, but seven of the past 10 years have been drought years, and rainfall for the past three years has averaged about 8 inches. The Basin receives virtually all of its recharge from rain, either as direct percolation or seepage from Los Osos Creek. Therefore, the substantial reduction in rainfall reduces recharge similarly, which results in substantially lower water tables, the main cause of seawater intrusion. Less recharge also means a higher rate of overdraft. The Basin Plan estimates the sustainable yield under "current conditions" (without any of the proposed Basin Plan mitigation programs) is 2450 AFY. Current production is about 2500 AFY. With the drought, a reasonable estimate of sustainable yield is half the Basin Plan estimate of 2450 AFY, or 1225 AFY. The drought will clearly have a very serious adverse impact on the Basin, but the Basin Plan does not address it.

Climate Change Impacts: The 2013 climate change evaluation, conducted by the USEPA, Morro Bay National Estuary Program (MBNEP), and Parties to the Basin Plan, found that the triple impacts of climate change (higher temperatures, sea level rise, and less rainfall) would reduce the "sustainable yield" of the Basin under current conditions to 1800 AFY from the current Basin Plan estimate of 2450 AFY, or about 25%. It also found that the yield increase predicted with all Basin Plan programs in place (3400 AFY) would drop to 2325 AFY, or about 32%, negating all the predicted increase. The evaluation concluded that Morro Bay Estuary ecosystems, including Los Osos Creek, could be adversely impacted by LOWWP and Basin Plan programs. The USEPA evaluation applied the same Basin model as used in the Basin Plan, but assumed less yearly rainfall (11.8" rather than 17"), higher temperatures, and sea level rise (see Exhibit 6, Pages 1, 3, 6 & 8). The study states "Climate change and precipitation trends and

patterns must be considered when planning for the future". The Basin Plan does not discuss this evaluation. It recommends adding a 20% margin of safety to account for "climate variability" but the 20% is not nearly enough, as explained below (see Page 113).

LOWWP Impacts: The Los Osos Waste Water Project EIR cites potential adverse impacts from the project on seawater intrusion, which it indicates would be reduced to insignificance by use of Broderson leach fields. The California Coastal Commission found substantial uncertainties in the ability of Broderson leach field and other LOWWP mitigations to avoid/minimize seawater intrusion and other impacts, so it added Special Condition 5 that requires conservation, recycled water reuse, monitoring, and adaptive programs to "maximize" the sustainability of the Basin and related resources (see Exhibit 11). Hydrologist and water resources expert Eugene Yates (hereinafter, "Yates"), one of the foremost authorities on the Los Osos Groundwater Basin and one of the creators of the Basin model, states that elimination of septic system return flows in conjunction with planned increases in pumping from the Upper Aquifer could cause seawater intrusion in that aquifer. He also states that the Project could adversely impact sensitive habitat by reducing groundwater flows (see Exhibit 1, Pages 4 & 5, and Exhibit 2, Pages 1 & 2). The Monterey Bay Watershed Institute also found that the LOWWP could adversely impact seawater intrusion in the Lower and Upper Aquifers and harm habitat (see Exhibit 3). These experts recommend maximizing conservation, recycled water use, and low impact development (LID) recharge measures, and implementing adaptive programs that put specific measures in place to address potential impacts. It is important to note that the Yates and the Monterey Bay Institute's reviews were done in 2010, so did not factor the added impacts of the present drought. The Basin Plan does not mention nor address LOWWP impacts, e.g., it does not provide specific contingency measures, nor does it maximize the conservation and recycled water reuse programs as recommended by experts and required by the LOWWP CDP.

Pumping Redistribution Impacts: The impacts from the redistribution of pumping (Basin Plan Infrastructure Programs A through D), in combination with LOWWP impacts, were not analyzed in the LOWWP EIR. However, Yates indicates additional pumping from the Upper Aquifer in conjunction with removal of septic system return flows can cause seawater intrusion in the Upper Aquifer. He also states that the redistribution of pumping will not increase yield and may not protect against seawater intrusion (see Exhibit 1, Page 4 and Exhibit 2, Pages 1 & 2). The USEPA finds that the LOWWP and Basin Plan programs can harm Morro Bay Estuary habitat, including Los Osos Creek, especially in combination with climate change impacts on groundwater and habitat (see Exhibit 6, e.g., Page 4). Further, the Monterey Watershed Institute cites potential impacts to the Upper Aquifer and habitat due to interruptions in groundwater flows, which will be exacerbated by added pumping in the Upper Aquifer and inland. Stetson Engineers, the firm hired by

the Parties to perform a peer review of the Basin model and proposed changes in pumping, warned that redistribution should be "gradual…with contingency plans in place" to address signs of harm to Basin resources (see Exhibit 3, e.g., Page 65 and Basin Plan, Page 80).

The Plan fails to fulfill the purpose of the Interlocutory Stipulated Judgment.

As a result of its deficiencies, the Basin Plan does not fulfill the stated purpose of the Interlocutory Stipulated Judgment "to establish a process for developing and implementing a BMP (Basin Management Plan) that will serve as a physical solution for the management of the Basin water resources…." It does not include as a main component: "A strategy for maximizing the reasonable and beneficial use of the Basin water resources while ensuring: the long-term integrity and viability of the Basin as a potable water supply for the Parties collectively and each Party individually, including water quantity and water quality: and the sustainability of environmentally sensitive areas within or influenced by the Basin hydrology" (Page 5). The Basin Plan also does not fulfill another stated purpose: to provide a "safe yield" (see ISJ, Component A).

The Plan fails to consider and incorporate the recommendations of experts.

The Basin Plan ignores several expert reviews of the Basin and related recommendations. Yates, concludes in two 2010 reviews that moving wells will not increase Basin yield and may not protect the Basin long-term. He also identifies substantial uncertainties in the model and points out that shifts in pumping to the Upper Aquifer in combination with the LOWWP could cause seawater intrusion in the Upper Aquifer (see Exhibit 1, Pages 1 - 4 & Exhibit 2, Pages 1 & 2). The Monterey Bay Watershed Institute in a 2010 review identifies major uncertainties in the potential of LOWWP mitigation programs to offset seawater intrusion impacts (e.g., Broderson leach field disposal), and it recommends that the past droughts and the "predictions of increased drought" be considered in Basin planning (see Exhibit 3, Page 69). Both Yates and the Monterey Bay Institute stress the need to maximize conservation, recycled water use, and on-site recharge measures (low impact development) to minimize LOWWP impacts, as a first priority. They also recommend having specific contingency measures in place to quickly respond to impacts that may occur despite maximized mitigations to avoid/minimize harm to the Basin (see Exhibit 1, Page 5, Exhibit 2, Pages 3 & 7, & Exhibit 3, Page 33, 56-67). The Basin Plan fails to discuss or implement any of these findings or recommendations.

Peter Pyle of Stetson Engineers, Inc., in a peer review of the model sponsored by the Parties in 2010, cautions that the present Basin model providing for moving wells inland should be implemented slowly and monitored often, having contingency measures in

place to avoid impacts. The review also recommends upgrading the model with monthly "transient" capability, having Cleath-Harris Geologists, Inc. state uncertainty values for the model, and including "climate change variables in modeling scenarios." The Basin Plan does not implement any of the recommendations. Instead, it states that the "Parties will consider making those improvements…particularly if grant funding becomes available from the state or federal governments" (see Page 80).

The Plan fails to apply modeling assumptions and decision making tools that prioritize preserving the Basin.

Modeling Assumptions and Safe Yield Estimates: The Basin Plan bases some of its most important findings and recommendations on modeling. However, Basin modeling does not include climate change factors and reduced rainfall predictions.

Neither does Basin Plan modeling factor potential impacts on Basin yield from the LOWWP and Basin Plan infrastructure programs (pumping redistribution). Yates points out that the combined impacts could cause seawater intrusion in the Upper Aquifer, reducing Basin yield and flows to habitat along the estuary, potentially requiring more production from the Basin to replace groundwater flows. Yates also states that pumping redistribution will not increase yields, and in fact the Basin Plan may be overstating yields by 40%.

The Basin Plan asserts that the overstating of estimates may not be known until harm is impossible to reverse (see Page 137).

Basin modeling has underestimated the rate of seawater intrusion and overestimated the Basin yield several times in the past. This is a key reason the Basin has been over-drafted 700 to 1,100 AFY on average (30-55%) since 1979 (see Basin Plan, Pages 46, 99, & 106). Current Basin Plan modeling continues to show a failure to exercise minimal reasonable caution. Preserving a high-value, threatened, and irreplaceable resource necessitates planning that "errs" on the side of preserving the resource. Monterey Bay Watershed Institute emphasizes the need for this type of management (see Exhibit 3, Pages 41, 56 & 67). Basin Plan modeling errs on the side of maximizing short-term yield to achieve buildout.

Metrics/Success Criteria: The Basin Plan applies three "metrics" to assess program success in stopping and reversing seawater intrusion:

The Yield Metric is a factor based on modeling, using predicted "sustainable yields" with different program options, divided by the Basin production.

The Basin Water Level Metric is determined by sampling water levels in a few Zone D wells, setting the target of 8 feet above mean sea level on average. Zone D is currently the main drinking water aquifer.

The Basin Chloride Metric sets an average of 100 mg/l of chlorides in a few Zone D wells, and is also determined by sampling.

The Yield Metric relies on Basin Plan modeling and does not provide a reasonably cautious tool for decision making. The other metrics rely on actual physical evidence and provide much more reliable results. However, they do not assess the programs' effects on Zone E, the large, deep aquifer which is a vital part of the Basin's structure that is more seriously impacted by seawater intrusion than Zone D.

Metrics do not assess Zone C, the Upper Aquifer where the Basin Plan proposes to shift a lot more pumping. Zone C was reported to be only "relatively stable" in the 2005 *Seawater Intrusion Assessment*, subject to seawater intrusion during droughts. Another problem with the Water Level and Chloride Metric is that they rely on a relatively small number of wells, which may result in skewed results andy high levels of seawater intrusion in some parts of the Basin). The Basin Plan also does not include a metric to measure Basin storage capacity, which the Basin Plan states is an important measure of Basin resilience (ability to weather droughts) (see Page 91).

The Plan fails to implement an effective adaptive management program and contingency measures.

The Basin Plan fails to identify and plan specific contingency measures to address impacts to the Basin that may occur despite mitigation programs. Instead, the Basin Plan includes what it calls an "Adaptive Management Plan" that is little more than a yearly review of monitoring data, which does not commit the Parties to take any action—nor does it ensure effective action is even feasible. According to the experts cited (Yates, Monterey Bay Watershed Institute), an effective adaptive/contingency program must include specific plans to address the most likely impacts, with the measures in place to ensure effective responses within a timeframe that minimizes harm to the Basin (see Exhibit 1, Page 5 and Exhibit 3, Pages 56-66).

The Plan fails to set time-specific objectives or use the authority needed to ensure effective program implementation as early as possible.

The Basin Plan states that "bold, decisive, and immediate" action is needed to preserve the Basin, but it does not set time-specific objectives and benchmarks for program implementation and achieving objectives—nor does it say the Parties will use the rights

and authorities granted to water management agencies/entities to ensure objectives are met within a timeframe that protects resources. The ISJ Agreement provides for the County to implement a Basin-management ordinance, and the Basin Plan indicates that the County has the authority to implement an ordinance to mandate private well monitoring (see ISJ, Page 8, and Basin Plan, Page 138). But the Basin Plan does not recommend mandatory well monitoring, despite stating that the current lack of accurate well data can result in permanent harm to the Basin (see Pages 103, 112, 137). The Basin Plan also does not recommend mandatory conservation outside the wastewater service area, pumping restrictions, or production limits (see Pages 15 & 188).

Improvements Critical to Basin Sustainability.

Given the protracted amount of time the Basin has been without management and protracted negotiations since the Court allowed the Parties to resolve issues via a voluntary Basin Planning process--and in light of the severe seawater intrusion problem made worse by an ongoing severe drought, as well as impending significant adverse impacts--we urge the Parties to immediately incorporate and implement the changes listed below as critical to Basin sustainability.

*Maximize the conservation program and comply with the Governor's Executive Order B-29-15.*The Basin Plan adopts the LOWWP program. The Coastal Development Permit (CDP) for the LOWWP requires the program to "help Basin residents to reduce their potable water use as much as possible," and the County to spend $5 million to "initiate" the program as soon as possible after permit approval in 2010. The CDP also says the program "shall not be limited to retrofit and low water-use fixtures, and grey water systems." So it includes outdoor measures, like grey water systems (see Exhibit 11 and Basin Plan, Pages 146 & 147). Currently, about $3.7 million of the $5 million remains unspent, although the program is well below implementation targets for indoor measures and has no outdoor component.

The Basin Plan must require the County-run program to maximize use of the remaining $3.7 million to improve the indoor program and to implement a comprehensive outdoor program. The outdoor program should include rebates and other incentives for grey water systems, rainwater harvesting, turf replacement, and conversion to low water-use landscaping. The Basin Plan should also set residential indoor-outdoor water use targets at less than 50 gpcd, consistent with the Governor's Executive Order and with other coastal communities (see Exhibit 7, Page 4, and Exhibit 9, Directives 1, 5 & 11).

Current residential water use in Los Osos is 70 to 75 gpcd, so targeting 50 gpcd for residential water use and a similar reduction in commercial and institutional use (as required by the Governor's Order) should meet the Governor's mandated reduction,

bringing 2013 urban water use (1670 AFY) down 25% to about 1250 AFY (see Basin Plan, Page 48 for 2013 water use. Urban water use includes purveyor and domestic production).

Maximize recycled water use. For the Basin Plan to maximize seawater intrusion mitigation, as required by the LOWWP CDP, more purple pipe connections and infrastructure should be installed west of Los Osos Creek, so that more recycled water can be used for "urban reuse" to offset pumping in that part of the Basin. Several studies, including the LOWWP *Fine Screening Report,* point out that urban reuse provides the greatest seawater intrusion mitigation in the Los Osos Basin, over twice as much mitigation as ground discharge into Broderson leach field and over five times as much as agricultural reuse east of Los Osos Creek (see Exhibit 4, Page 2-6). State law provides for mandating recycled water use if it is available, and the Parties should do so.

Maximize infrastructure programs. The Basin Plan recommends Programs A and C under the "current population scenario" (which shift some pumping to the Upper Aquifer and much more inland). Program A is already implemented and Program C should be implemented, with contingency plans in place to address impacts as experts recommend. The Basin Plan recommends one of the most cost-effective programs, Program D (use of wells east of Los Osos Creek to supply water west of Los Osos Creek) only for a "buildout population scenario." Program D should be implemented as soon as possible (at least by LOWWP start up) to maximize seawater intrusion mitigation and provide management flexibility. It is needed to support the current population. It maximizes Basin sustainability by allowing for flexibility where water is pumped and by helping to maintain Basin balance west and east of Los Osos Creek when the LOWWP is implemented. Program B (larger shifts in pumping to the Upper Aquifer) should be re-evaluated for its cost versus its risks and benefits, given the multiple impacts of the drought, climate change, LOWWP, and shifts in pumping, especially on the Upper Aquifer.

Apply modeling assumptions and decision making tools that prioritize preserving the Basin and clarify the criteria for sustainable buildout.

Modeling Assumptions and Safe Yield Estimates: Basin Plan modeling should factor the on-going drought and climate change variables, potential impacts from the LOWWP and Basin Plan infrastructure programs, and all other potential impacts and uncertainties affecting sustainable yield and seawater intrusion rate estimates. A thorough sensitivity analysis should be included in the Basin Plan that provides the specific basis for modeling assumptions used, along with a generous margin of error (one that "errs" on side of caution). Based on the modeling (and the revised definition of "sustainable yield" below) new, more cautious and realistic sustainable yield targets should be established.

The USEPA climate change evaluation provides a good place to start. The evaluation estimates "sustainable yields" at 1800 AFY without Basin Plan programs in place and 2325 AFY with all programs in place. However, the evaluation uses the current Basin Plan definition of "sustainable yield," which allows seawater intrusion to advance. The Basin Plan recommends subtracting 20% to reverse seawater intrusion. Therefore, we recommend a targeted Basin yield of under 2000 AFY for the current population with Infrastructure Programs A, C, and D in place. This provides a reasonably cautious target given present conditions that can be changed in the future based on conclusive evidence (i.e., well monitoring over time).

"Sustainable Yield Definition: "Sustainable yield" should be defined as a yield that reduces seawater intrusion and restores the Basin's freshwater storage capacity and resilience.

Metrics/Success Criteria: The Yield Metric would change with the revised modeling and refined sustainable yield above. However, the Basin Plan should clearly state the uncertainties inherent in prediction results from a measure based on modeling, also the potential adverse impacts of some measures modeled, such as shifts in pumping to the Upper Aquifer and inland.

The Basin Water Level and Basin Chloride Metrics should be based on the data from all production and test wells, and should be extended to Zones C and E. This would better ensure the overall health of the Basin and reduce the potential for anomalies or biases in data. Metric criteria should also include minimum acceptable water levels and maximum chlorides concentrations at any one well in the groups measured. Especially if/when all wells are used for metrics, average chloride levels should be set substantially lower than 100 mg/l. The Basin Plan should also include a metric to measure Basin storage capacity.

Consistent with reasonably cautious planning, the Basin Plan should only allow additional building based on conclusive evidence (water level and chloride data over time) showing that the Basin will support the current population and there is enough additional water to support a larger population. Revising yield estimates and the sustainable yield definition should help make this clear.

Seawater intrusion has shown no sign of slowing in 35 years, and has instead accelerated since 2000 despite substantial cut backs in pumping. Given current Basin conditions, applying the current "sustainable yield" predictions will only lead to unsustainable growth.

Achieving a sustainable Basin requires all current property owners to maximize water use efficiency (conservation and recycled water use). It also requires the Basin Plan to

include programs that will do this, as well as the most effective infrastructure programs. Additional development dependent on the Basin will harden demand at a higher level of water use, raising overall demand and making it more difficult to reduce use with efficiency measures.

Develop specific contingency plans to avoid or minimize impacts that could occur despite maximized mitigation programs and revised yield targets.

The impacts we discuss above (e.g., drought, climate change, LOWWP and infrastructure programs), especially in combination, should be analyzed and modeled. Based on the analysis and modeling, specific contingency measures should be planned with criteria or triggers indicating when these measures should be implemented. These are necessary because the impacts can cause severe harm to the Basin, even with the improved programs and the lower yield estimates and production targets we request. Contingency measures might include additional outdoor watering restrictions, water budgets, and changes in where water is pumped via cooperative pumping arrangements. The LOCSD, one of the Parties (supplier for about one-half of the urban area), recently implemented a Water Shortage Contingency Plan with five stages of emergency that has both climate triggers (based on rainfall) and seawater intrusion triggers (based on chloride levels at supply wells). The District declared a Stage III emergency on April 2, 2015, based on low rainfall (43 inches of rain for three years). It set water allocations at 50 gallons gpcd with penalties for exceeding the allocation. (The plan with penalties is consistent with Directive 8 of the Governor's Executive Order B-29-15—see Exhibit 9). If the drought continues or chloride levels reach the triggers for identified wells, the District will go to a Stage IV or V, reducing allocations to 45 and 42 gpcd gallons respectively, with additional restrictions. On April 2, the District also added a provision to Stage III that no "intent to serve" notices (notices of intent to provide service for new development) would be issued. This restriction had been only for Levels IV & V previously. The Basin Plan should include similar plans with triggers to address the drought and other threats to the Basin. The Monterey Bay Watershed Institute identifies several areas of uncertainty (potential impacts from the LOWWP) that should have contingency plans and it recommends specific measures and a method for developing the plan (see Exhibit 3, Pages 56-66).

Set time-specific objectives and benchmarks for maximizing Basin Plan programs and reversing seawater intrusion as soon as possible, and use all the rights and authorities available to water management agencies/entities to ensure objectives are met.

The Basin Plan must set time-specific objectives and benchmarks for maximizing mitigation programs Basin-wide and achieving conservation and production targets as soon as possible. Basin-wide conservation should be maximized this year consistent with

LOWWP and Governor's Executive Order. Recycled water use should be maximized by LOWWP startup, and infrastructure programs to redistribute pumping should be maximized within one year. The County and Parties should use all powers granted to them by law to ensure programs are maximized and management objectives are met. These powers should include ordinances mandating the monitoring of private wells, Basin-wide conservation (including outdoor conservation), and the use of recycled water (where it has the greatest benefits). A management ordinance or ordinances should also include the options of mandated pumping restrictions or allocations to meet objectives and avoid harm to the Basin. Additional funding, if needed, should be developed through all means available to the Parties. The Governor's Executive Order prioritizes grant funding for local agencies with efficient landscaping ordinances in place, and requires the State Water Board to direct suppliers to use "pricing mechanisms, including but not limited to surcharges, fees, and penalties, to maximize water conservation…" (see Exhibit 9, Directives 8 & 11). These measures should be applied first, with grant funding emphasized consistent with the ISJ agreement (Component E, Page 5). Other laws allow the Parties to assess property owners for administration and other program costs based on water use, which should be used if needed.

(See Exhibit 8, comments and recommendations previously submitted to the Parties, for further detail, explanation, and support of the above requests).

Requested modifications are consistent with state policy the LOWWP CDP, Basin Plan, and ISJ.

The improvements/modifications we request are supported by State agencies and authorities and experts who recommend maximizing conservation and recycled water use to address threatened groundwater resources and seawater intrusion, especially in the current drought. The improvements are also consistent with the LOWWP Coastal Development Permit, which requires project conservation and recycled water use programs to maximize the sustainability of the Basin and related resources. Requested improvements are also consistent with the Basin Plan itself as they will increase the benefits of the three primary mitigation programs proposed in the Plan and potential to reverse seawater intrusion and provide a sustainable water supply for the existing population (see Page 21). These improvements are also consistent with the ISJ.

For all of the foregoing reasons, Sierra Club and LOSG urge the Parties to implement the above recommendations prior to submitting the Basin Plan to the court for approval. We do not support the Basin Plan without these improvements.