

B.3 CHAPTER APPENDIX A – JURISDICTIONAL STRATEGIES

CITY OF EL CAJON

San Diego River Illicit Discharge Detection and Elimination Program Strategies City of El Cajon		Implementation Timeframe	Frequency
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.			
Utilize municipal personnel and contractors to identify and report illicit discharges and connections.	Current	Continuous	
Facilitate public reporting of illicit discharges and connections via telephone and email.	Current	Continuous	
Coordinate with upstream entities to prevent illicit discharges from upstream sources from entering the MS4.	Current	Continuous	
2. Develop and implement approaches to address the impacts of septic systems within the watershed.			
Investigate and eliminate illicit discharges and connections.	Current	Continuous	
4. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Implement practices and procedures to prevent/limit infiltration of seepage from sanitary sewers to the MS4.	Current	Continuous	
Implement practices and procedures to address spills with the potential to enter the MS4.	Current	Continuous	
Investigate and eliminate illicit discharges and connections.	Current	Continuous	
5. Implement monitoring programs to provide new information to refine the prioritization of drainage areas.			
Conduct transitional MS4 outfall discharge program ¹ to identify persistent/transient flows.	FY 14-15	Twice per Year	
Conduct watershed specific MS4 outfall discharge program to identify persistent/transient flows.	FY 15-16	TBD	
6. Actively educate public on prohibitions related to illicit discharges and connections.			
Investigate and eliminate illicit discharges and connections.	Current	Continuous	
Enforce legal authority to ensure all illicit discharges and connections that are identified are eliminated.	Current	As Needed	
Optional Jurisdictional Strategies			
Maintain MS4 map to facilitate implementation of the IDDE program.	Current	Annual	

San Diego River Watershed Development Planning Program Strategies City of El Cajon	Implementation Timeframe	Frequency
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.		
Establish criteria designating priority development projects for new development and redevelopment projects.	FY 15-16	One Time
Update BMP design manual procedures to specify stormwater requirements applicable to development and redevelopment projects, identify and design appropriate BMPs, establish maintenance criteria, and establish alternative compliance options (where implemented).	Current	One Time
2. Develop and implement LID programs to complement standard permit requirements.		
Implement downspout disconnection program for industrial, commercial, and residential projects.	Current	Project Specific
Implement proprietary BMPs where appropriate for industrial, commercial, and residential projects.	Current	Project Specific
Implement rainwater harvesting where appropriate for industrial, commercial, and residential projects.	Current	Project Specific
3. Implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation and identify a list of candidate projects that could be used as alternative compliance options for Priority Development Projects.		
Develop and implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation.	FY 15-16	One Time
5. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.		
Implement source control, LID, and on-site structural controls for all priority development projects.	Current	Continuous
Implement a program that ensures that all structural BMPs are designed, constructed, and maintained on PDPs.	Current	Continuous
Inspect all high priority structural BMPs prior to the rainy season for Copermittees.	Current	Annual
6. Enforce post construction requirements related to new and redevelopment.		
Require implementation of source control and low impact development (LID) BMPs for all development projects.	Current	Continuous

San Diego River Watershed Construction Management Program Strategies City of El Cajon		Implementation Timeframe	Frequency
1. Ensure that minimum BMPs are designated and required for construction projects.			
Require submittal of pollution control plan, construction BMP plan, and/or erosion and sediment control plan for projects requiring local permits involving soil disturbance activities.		Current	Continuous
Review and confirm that the submitted plan is in compliance.		Current	Continuous
Maintain, update, and prioritize a watershed based inventory of all projects issued local permits that allow soil disturbing activities.		Current	Quarterly
Implement or require implementation of BMPs that are site specific, seasonally appropriate, and appropriate to the construction phase year round.		Current	Continuous
Inspect construction sites at an appropriate frequency to require and confirm compliance with local permits and ordinances, as well as the MS4 Permit requirements.		Current	Per JRMP
Enforce legal authority to ensure inventoried construction projects are in compliance with all requirements.		Current	As Needed

San Diego River Existing Development Management Program Strategies City of El Cajon		Implementation Timeframe	Frequency
1. Maintain and improve data tracking methods for existing development inventories where necessary.			
Maintain and update a watershed based inventory of existing development (i.e., commercial, industrial, and municipal facilities and residential areas).	Current	Annual	
2. Develop and implement approaches to address the impacts of improper water use and irrigation runoff.			
Provide or expand targeted outreach to homeowners associations	FY 15-16	Continuous	
3. Improve and/or continue existing pet waste programs.			
Continue implementation of pet waste bag dispensers in public parks	Current	Continuous	
4. Improve trash management strategies within the watershed.			
Implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways.	Current	Continuous	
5. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	Current	Continuous	
6. Improve and implement existing outreach programs to target key sources and pollutants.			
Provide targeted outreach via printed materials to residential areas	FY 15-16	Continuous	
7. Enhance existing MS4 maintenance programs.			
Implement a schedule of operation and maintenance activities for the MS4 and related structures.	Current	Per JRMP	
Consider implementation of dry weather flow diversions depending on outcome of Watershed Management Area Analysis	FY 15-16	As Needed and Funding Allows	
8. Develop and implement targeted programs to address issues in residential areas.			
Conduct residential management area focused inspections.	FY 15-16	Per JRMP	
9. Improve existing inspection programs to more efficiently target key sources.			
Conduct inspections of inventoried existing development to ensure compliance. Each area/activity inspected once every five years minimum, with equivalent of 20% of inventory inspected annually.	Current	Per JRMP	

San Diego River Existing Development Management Program Strategies City of El Cajon		Implementation Timeframe	Frequency
10. Actively enforce stormwater and urban runoff requirements for existing development.			
Designate and require minimum set of BMPs required for all inventoried existing development.		Current	One Time
Enforce legal authority to ensure inventoried existing development facilities and/or areas are in compliance with all requirements.		Current	As Needed
11. Identify and facilitate retrofit opportunities in areas of existing development.			
Develop a strategy to identify opportunities and facilitate the implementation of retrofit projects in areas of existing development.		FY 15-16	One Time
Consider implementation of green streets depending on WMAA results		FY 15-16	Dependent on Results, Need, and Funding
Optional Jurisdictional Strategies			
Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties.		Current	Continuous
Develop a strategy to identify opportunities and facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development.		FY 15-16	One Time
Forrester Creek Bacteria Management Plan implementation		FY 15-16	Continuous

CITY OF LA MESA

San Diego River Illicit Discharge Detection and Elimination Program Strategies City of La Mesa		Implementation Timeframe	Frequency
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.			
Utilize municipal personnel and contractors to identify and report illicit discharges and connections.		Current	Continuous
Provide enhanced internal training for field staff related to illicit discharges.		FY 15-16	Annual
Facilitate public reporting of illicit discharges and connections via telephone and email.		Current	Continuous
Coordinate with Helix Water District regarding water line flushing and discharges to the MS4		FY 15-16	Continuous
Coordinate with upstream entities to prevent illicit discharges from upstream sources from entering the MS4.		Current	Continuous
2. Develop and implement approaches to address the impacts of septic systems within the watershed.			
Investigate and eliminate illicit discharges and connections.		Current	Continuous
3. Develop and implement approaches to address the impacts of homeless activities within the watershed.			
Cleanup of encampment sites on public and private lands.		FY 15-16	As Needed
Coordination with La Mesa Police Department to perform routine sweeps		FY 15-16	Continuous
4. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Require all Food Service Establishments to install grease removal equipment to prevent fats, oils, and grease from obstructing sewer lines		FY 15-16	Continuous
Increase outreach to facilities and residences generating fats, oils, and grease.		FY 15-16	Continuous
Implement practices and procedures to prevent/limit infiltration of seepage from sanitary sewers to the MS4.		Current	Continuous
Implement practices and procedures to address spills with the potential to enter the MS4.		Current	As Needed
Implement sanitary sewer system rehabilitation program (e.g., condition assessments, prioritization, pipe replacement)		FY 15-16	Continuous
Investigate and eliminate illicit discharges and connections.		Current	Continuous

San Diego River Illicit Discharge Detection and Elimination Program Strategies City of La Mesa		Implementation Timeframe	Frequency
5. Implement monitoring programs to provide new information to refine the prioritization of drainage areas.			
Conduct transitional MS4 outfall discharge program ¹ to identify persistent/transient flows.	FY 14-15	Twice per Year	
Conduct watershed specific MS4 outfall discharge program to identify persistent/transient flows.	FY 15-16	Twice per Year	
6. Actively educate public on prohibitions related to illicit discharges and connections.			
Investigate and eliminate illicit discharges and connections.	Current	Continuous	
Enforce legal authority to ensure all illicit discharges and connections that are identified are eliminated.	Current	As Needed	
Optional Jurisdictional Strategies			
Maintain MS4 map to facilitate implementation of the IDDE program.	Current	Annual	

San Diego River Watershed Development Planning Program Strategies City of La Mesa		Implementation Timeframe	Frequency
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.			
Establish criteria designating priority development projects for new development and redevelopment projects.	FY 15-16	One Time	
Update BMP design manual procedures to specify stormwater requirements applicable to development and redevelopment projects, identify and design appropriate BMPs, establish maintenance criteria, and establish alternative compliance options (where implemented).	Current	One Time	
3. Implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation and identify a list of candidate projects that could be used as alternative compliance options for Priority Development Projects.			
Develop and implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation.	FY 15-16	One Time	
4. Consider the development of an alternative compliance program for Priority Development Projects.			
Consider implementation of an alternative compliance program to provide off-site alternatives for pollutant control and hydromodification management.	FY 18-19	Continuous	
5. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.			
Implement source control, LID, and on-site structural controls for all priority development projects.	Current	Continuous	
Implement a program that ensures that all structural BMPs are designed, constructed, and maintained on PDPs.	Current	Continuous	
Inspect all high priority structural BMPs prior to the rainy season for Copermittees.	Current	Annual	
6. Enforce post construction requirements related to new and redevelopment.			
Require implementation of source control and low impact development (LID) BMPs for all development projects.	Current	Continuous	
Enforce legal authority to ensure all development projects are in compliance with all post construction requirements.	Current	As Needed	
Update ordinances to reflect new land development requirements.	FY 15-16	One Time	

San Diego River Watershed Construction Management Program Strategies City of La Mesa		Implementation Timeframe	Frequency
1. Ensure that minimum BMPs are designated and required for construction projects.			
Require submittal of pollution control plan, construction BMP plan, and/or erosion and sediment control plan for projects requiring local permits involving soil disturbance activities.		Current	Continuous
Review and confirm that the submitted plan is in compliance.		Current	Continuous
Maintain, update, and prioritize a watershed based inventory of all projects issued local permits that allow soil disturbing activities.		Current	Quarterly
Implement or require implementation of BMPs that are site specific, seasonally appropriate, and appropriate to the construction phase year round.		Current	Continuous
Inspect construction sites at an appropriate frequency to require and confirm compliance with local permits and ordinances, as well as the MS4 Permit requirements.		Current	Per JRMP
Enforce legal authority to ensure inventoried construction projects are in compliance with all requirements.		Current	As Needed
2. Provide enhanced outreach and coordination to convey construction requirements.			
Increase coordination with internal engineering and building inspections programs through internal meetings and enhanced training.		FY 15-16	Continuous

San Diego River Existing Development Management Program Strategies City of La Mesa		Implementation Timeframe	Frequency
1. Maintain and improve data tracking methods for existing development inventories where necessary.			
Maintain and update a watershed based inventory of existing development (i.e., commercial, industrial, and municipal facilities and residential areas).		Current	Annual
2. Develop and implement approaches to address the impacts of improper water use and irrigation runoff.			
Increase outreach regarding over irrigation.		FY 15-16	Continuous
Install weather based irrigation controllers in municipal parks.		FY 15-16	On Going
Explore options for coordination with Helix Water District regarding water conservation programs.		FY 15-16	Continuous
3. Improve and/or continue existing pet waste programs.			
Continue implementation of pet waste program.		Current	Continuous
Provide focused outreach to residents using kiosks in municipal parks.		FY 15-16	Continuous
4. Improve trash management strategies within the watershed.			
Coordinate with I Love a Clean San Diego to install cigarette ashcans throughout the downtown area.		FY 15-16	Continuous
Perform trash assessments and outreach targeting multi-family residential land uses.		FY 15-16	Continuous
Increase street sweeping frequencies in priority areas.		FY 15-16	Continuous
5. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.		Current	Continuous
Perform coordinated inspections for stormwater and FOG at food service establishments.		Current	Continuous
6. Improve and implement existing outreach programs to target key sources and pollutants.			
Provide enhanced internal training to parks staff.		FY 15-16	Annual
Provide enhanced internal training to street maintenance staff.		FY 15-16	Annual
8. Develop and implement targeted programs to address issues in residential areas.			
Prioritize residential management areas for focused inspections.		FY 15-16	Continuous
9. Improve existing inspections programs to more efficiently target key sources.			
Perform evaluations of businesses for exposure to stormwater through increased patrols and inspections.		FY 15-16	Per JRMP

San Diego River Existing Development Management Program Strategies City of La Mesa		Implementation Timeframe	Frequency
10. Actively enforce stormwater and urban runoff requirements for existing development.			
Increase coordination with City Code Enforcement where properties are out of compliance.		FY 15-16	As Needed
Increased enforcement as appropriate as a result of increased business inspections.		FY 15-16	As Needed
11. Identify and facilitate retrofit opportunities in areas of existing development.			
Install weather based irrigation controllers in municipal parks.		FY 15-16	Continuous
13. Improve coordination between agencies.			
Explore options for coordination with Helix Water District regarding water conservation programs.		FY 15-16	Continuous
Optional Jurisdictional Strategies			
Alvarado Creek Restoration Project		FY 15-16	One Time Project

CITY OF SANTEE

San Diego River Illicit Discharge Detection and Elimination Program Strategies City of Santee		Implementation Timeframe	Frequency
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.			
Utilize municipal personnel and contractors to identify and report illicit discharges and connections.		Current	Continuous
Facilitate public reporting of illicit discharges and connections via telephone and email.		Current	Continuous
Coordination with Padre Dam Municipal Water District regarding sanitary sewer overflow notifications and cleanup.		Current	Continuous
Coordinate with upstream entities to prevent illicit discharges from upstream sources from entering the MS4.		Current	Continuous
2. Develop and implement approaches to address the impacts of homeless activities within the watershed.			
River "sweeps" to address homeless encampments twice per month.		Current	Twice per Month
Weekly patrols of known encampment areas.		Current	Weekly
Implement Bicycle Patrol Team in conjunction with San Diego County Sherriff's Department		FY 15-16	Continuous
Improved coordination between Public Works staff and San Diego County Sherriff's Department.		Current	Continuous
Provide waste stations for homeless encampments (e.g., portable toilets, trash receptacles)		FY 15-16	TBD
Continue coordination of Enforcement Team including the Fire Marshall, Code Enforcement, Stormwater Program Manager, City Attorney, and Sherriff's Department		Current	Continuous
3. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Coordination with Padre Dam Municipal Water District regarding sanitary sewer overflow notifications and cleanup.		Current	Continuous
Increase use of fact sheet for sewer maintenance.		Current	Continuous
Implement practices and procedures to prevent/limit infiltration of seepage from sanitary sewers to the MS4.		Current	Continuous
Implement practices and procedures to address spills with the potential to enter the MS4.		Current	Continuous
Investigate and eliminate illicit discharges and connections.		Current	Continuous

San Diego River Illicit Discharge Detection and Elimination Program Strategies City of Santee		Implementation Timeframe	Frequency
4. Implement monitoring programs to provide new information to refine the prioritization of drainage areas.			
Conduct transitional MS4 outfall discharge program ¹ to identify persistent/transient flows.		FY 14-15	Twice per Year
Conduct watershed specific MS4 outfall discharge program to identify persistent/transient flows.		FY 15-16	Twice per Year
5. Actively educate public on prohibitions related to illicit discharges and connections.			
Investigate and eliminate illicit discharges and connections.		Current	Continuous
Enforce legal authority to ensure all illicit discharges and connections that are identified are eliminated.		Current	As Needed
Optional Jurisdictional Strategies			
Maintain MS4 map to facilitate implementation of the IDDE program.		Current	Annual

San Diego River Watershed Development Planning Program Strategies City of Santee	Implementation Timeframe	Frequency
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.		
Establish criteria designating priority development projects for new development and redevelopment projects.	FY 15-16	One Time
Update BMP design manual procedures to specify stormwater requirements applicable to development and redevelopment projects, identify and design appropriate BMPs, establish maintenance criteria, and establish alternative compliance options (where implemented).	Current	One Time
2. Develop and implement LID programs to complement standard permit requirements.		
Require full enclosures for trash areas.	FY 15-16	Continuous
3. Implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation and identify a list of candidate projects that could be used as alternative compliance options for Priority Development Projects.		
Develop and implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation.	FY 15-16	One Time
4. Consider the development of an alternative compliance program for Priority Development Projects.		
The City will consider implementation of an alternative compliance program to provide off-site alternatives for pollutant control and hydromodification management, dependent on need and funding.	FY 18-19	One Time
5. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.		
Implement source control, LID, and on-site structural controls for all priority development projects.	Current	Continuous
Implement a program that ensures that all structural BMPs are designed, constructed, and maintained on PDPs.	Current	Continuous
Inspect all high priority structural BMPs prior to the rainy season for Copermittees.	Current	Annual
6. Enforce post construction requirements related to new and redevelopment.		
Require implementation of source control and low impact development (LID) BMPs for all development projects.	Current	Continuous
Enforce legal authority to ensure all development projects are in compliance with all post construction requirements.	Current	As Needed

San Diego River Watershed Construction Management Program Strategies City of Santee		Implementation Timeframe	Frequency
1. Ensure that minimum BMPs are designated and required for construction projects.			
Require submittal of pollution control plan, construction BMP plan, and/or erosion and sediment control plan for projects requiring local permits involving soil disturbance activities.		Current	Continuous
Review and confirm that the submitted plan is in compliance.		Current	Continuous
Maintain, update, and prioritize a watershed based inventory of all projects issued local permits that allow soil disturbing activities.		Current	Quarterly
Implement or require implementation of BMPs that are site specific, seasonally appropriate, and appropriate to the construction phase year round.		Current	Continuous
Inspect construction sites at an appropriate frequency to require and confirm compliance with local permits and ordinances, as well as the MS4 Permit requirements.		Current	Per JRMP
Enforce legal authority to ensure inventoried construction projects are in compliance with all requirements.		Current	As Needed
Target construction sites with increased enforcement as appropriate, especially related to trash management.		FY 15-16	As Needed
2. Provide enhanced outreach and coordination to convey construction requirements.			
Provide internal staff training related to construction stormwater management.		Current	Annual
Provide public education and outreach targeting the construction industry.		FY 15-16	Continuous
Coordination with engineering and building inspections divisions to address SSOs caused by debris in sanitary sewer lines following new construction; review sign off procedures to ensure that debris in lines is avoided.		FY 15-16	Continuous

San Diego River Existing Development Management Program Strategies City of Santee	Implementation Timeframe	Frequency
1. Maintain and improve data tracking methods for existing development inventories where necessary.		
Maintain and update a watershed based inventory of existing development (i.e., commercial, industrial, and municipal facilities and residential areas).	Current	Annual
2. Develop and implement approaches to address the impacts of improper water use and irrigation runoff.		
Coordinate with Padre Dam Municipal Water District to encourage proper enforcement of water conservation requirements.	FY 15-16	Continuous
Coordinate with Padre Dam Municipal Water District to provide joint outreach to residents and businesses regarding irrigation practices.	FY 15-16	Continuous
Coordinate with Padre Dam Municipal Water District to increase incentive programs	FY 15-16	Continuous
Coordinate with County of San Diego to promote Sustainable Landscapes Program.	FY 15-16	Continuous
Develop education and outreach to reduce over-irrigation.	FY 15-16	TBD
3. Improve and/or continue existing pet waste programs.		
Pet Waste Bag Dispenser Stations in City Parks and Residential Areas	Current	Continuous
4. Improve trash management strategies within the watershed.		
Develop and distribute "Keep Lids Closed" stickers for dumpsters.	FY 15-16	Continuous
Target commercial centers for increased enforcement, especially related to trash management.	FY 15-16	As Needed
Coordination with Santee School District for trash management.	Current	Continuous
Implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways.	Current	Continuous
Require sweeping and maintenance of private roads in targeted areas.	Current	Continuous
Continue reporting and evaluating volumes of trash removed from illegal dumping activities	Current	Annual
Develop outreach program similar to the "Don't Trash California" campaign, including updates to existing outreach materials.	Current	Continuous
Enhance and expand trash cleanups through community-based organizations involving target audiences.	FY 15-16	TBD

San Diego River Existing Development Management Program Strategies City of Santee		Implementation Timeframe	Frequency
5. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	Current	Continuous	
Develop a strategy to identify and provide outreach to gray water system owners	FY 15-16	One Time	
6. Improve and implement existing outreach programs to target key sources and pollutants.			
Increase seasonal specific outreach related to water use via business journals.	FY 15-16	Quarterly	
Enhanced outreach to pool owners and maintenance companies - due to economic downturn, people have stopped maintaining pools, when flushed, may contain bacteria.	FY 15-16	Continuous	
Golf Course - outreach specific to management of landscaping and water use; bio solids use as fertilizer/storage.	FY 15-16	Continuous	
SDR Trail Expansion (City Parks) - interpretive signage; demonstration project for drought tolerant/native landscaping, permeable surfaces, and other LID.	FY 15-16	One Time Project	
Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	FY 15-16	One Time Update	
Enhance school and recreation-based education and outreach.	FY 15-16	TBD	
7. Enhance existing MS4 maintenance programs.			
Implement a schedule of operation and maintenance activities for the MS4 and related structures.	Current	Per JRMP	
Prioritized MS4 cleaning program based on land use density and traffic flows.	Current	Per JRMP	
Investigate potential to use ultra-violet lights in the MS4.	FY 15-16	One Time	
Implement invasive species removal projects in coordination with San Diego River Conservancy.	Current	As Needed	
8. Develop and implement targeted programs to address issues in residential areas.			
Conduct residential management area focused inspections.	FY 15-16	Per JRMP	
Prioritize residential management areas for focused inspections.	FY 15-16	Continuous	
Provide or expand targeted outreach to homeowners associations.	FY 15-16	TBD	
Provide targeted outreach via printed materials to residential areas.	FY 15-16	Continuous	

San Diego River Existing Development Management Program Strategies City of Santee	Implementation Timeframe	Frequency
9. Improve existing inspections programs to more efficiently target key sources.		
Conduct inspections of inventoried existing development to ensure compliance. Each area/activity inspected once every five years minimum, with equivalent of 20% of inventory inspected annually.	Current	Per JRMP
10. Actively enforce stormwater and urban runoff requirements for existing development.		
Designate and require minimum set of BMPs required for all inventoried existing development.	Current	One Time
Increase identification and enforcement of actionable erosion and slope stabilization issues on private property and require stabilization and repair.	FY 15-16	Continuous
Enforce legal authority to ensure inventoried existing development facilities and/or areas are in compliance with all requirements.	Current	As Needed
11. Identify and facilitate retrofit opportunities in areas of existing development.		
Develop a strategy to identify opportunities and facilitate the implementation of retrofit projects in areas of existing development.	FY 15-16	One Time
Consider implementation of green streets depending on WMAA results.	FY 15-16	Dependent on Results, Need, and Funding
Coordinate with Padre Dam Municipal Water District to increase incentive programs	FY 15-16	Continuous
Coordinate with County of San Diego to promote Sustainable Landscapes Program.	FY 15-16	Continuous
13. Improve coordination between agencies.		
Increased public outreach through external professional organizations (e.g., APWA, ASCE, Chamber of Commerce) - leveraging groups/contacts/newsletter.	FY 15-16	TBD
Coordinate with Padre Dam Municipal Water District to encourage proper enforcement of water conservation requirements.	FY 15-16	Continuous
Coordinate with Padre Dam Municipal Water District to provide joint outreach to residents and businesses regarding irrigation practices.	FY 15-16	Continuous
Coordinate with Padre Dam Municipal Water District to increase incentive programs.	FY 15-16	Continuous
Coordinate with County of San Diego to promote Sustainable Landscapes Program.	FY 15-16	Continuous

San Diego River Existing Development Management Program Strategies City of Santee	Implementation Timeframe	Frequency
Optional Jurisdictional Strategies		
Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties.	Current	Continuous
Develop a strategy to identify opportunities and facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development.	FY 15-16	One Time

COUNTY OF SAN DIEGO

San Diego River Illicit Discharge Detection and Elimination Program Strategies County of San Diego		Implementation Timeframe	Frequency
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.			
Develop and implement a strategy for investigating and addressing ICIDs.		FY 15	One Time
Maintain MS4 map to facilitate implementation of the IDDE program.		Current	Annual
Provide enhanced and focused training for County field staff related to illicit discharges.		FY 16	Annual
Refer homeless issue complaints to Sheriff or appropriate jurisdictions.		Current	Continuous
Bilingual hotline answered by I Love a Clean San Diego (ILACSD; live operator) with multiple avenues for online reporting.		FY 16	Continuous
Coordinate with upstream entities to prevent illicit discharges from upstream sources from entering the MS4.		Current	Continuous
2. Develop and implement approaches to address the impacts of septic systems within the watershed.			
Address septic system failures where observed.		Current	As Needed
3. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Coordinate spill response with responsible sewer agencies.		Current	Continuous
Implement practices and procedures to address spills with the potential to enter the MS4.		Current	Continuous
4. Implement monitoring programs to provide new information to refine the prioritization of drainage areas.			
Monitor MS4 outfalls for discharges of potential ICIDs.		Current	Annual
5. Actively enforce prohibitions related to illicit discharges and connections.			
Investigate and eliminate illicit discharges and connections.		Current	Continuous
Enforce legal authority to ensure all illicit discharges and connections that are identified are eliminated.		Current	As Needed
Update ordinances to reflect current ICID requirements and strategies.		FY 15-16	One Time
Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.		Current	Continuous

San Diego River Illicit Discharge Detection and Elimination Program Strategies County of San Diego	Implementation Timeframe	Frequency
Optional Jurisdictional Strategies		
Implement septic system rebate program with availability of grant funding.	FY 16	Continuous
Develop a pilot online septic system maintenance outreach program.	Current	Continuous
In collaboration with the Department of Environmental Health, consider development of incentive programs for pumping septic systems in high risk areas adjacent to waterways (within 600 ft.) or stormwater system; subject to grant funding.	TBD	TBD
In collaboration with the Department of Environmental Health, consider developing program for on-site wastewater treatment (septic) systems. May include mapping and risk assessment, inspection, or maintenance practices.	TBD	TBD
Consider collaboration with wastewater agencies to identify where sewer and stormwater infrastructure are in close proximity and confirm the absence of flow at nearby stormwater MS4 outfall during dry weather.	TBD	TBD
Collaborate with watershed partners to evaluate feasibility of invasive plant and invasive/feral animal removal.	Current	Continuous
Consider collaboration with watershed partners to remove invasive non-native plants (Arundo) upstream areas rivers or tributaries to increase flood and fire protection and reduce the number of unauthorized encampments on the river bottom.	TBD	TBD
Investigate the feasibility of developing a pilot program (including training) - volunteer surveillance program.	FY 16-17	Continuous
Conduct dry weather Microbial Source Tracking study at MS4 outfalls with flow; further prioritization of drainage areas.	FY15	One time

San Diego River Watershed Development Planning Program Strategies County of San Diego		Implementation Timeframe	Frequency
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.			
Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.		In Development	FY 16
Conduct BMP Design Manual training - Internal		FY 16	One Time
Conduct BMP Design Manual training – External		FY 16	One Time
2. Implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation and identify a list of candidate projects that could be used as alternative compliance options for Priority Development Projects.			
Develop and implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation.		FY 15-16	One Time
3. Consider the development of an alternative compliance program for Priority Development Projects.			
Consider implementation of an alternative compliance program to provide off-site alternatives for pollutant control and hydromodification management.		Future	In development
4. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.			
All development projects: Implement or require implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area, where applicable and feasible.		Current	Continuous
Priority Development Projects (PDP): In addition to requirement for all development projects, implement or require implementation of onsite structural BMPs to control pollutants and manage hydromodification for PDPs.		Current	Continuous
Implement a program that requires and confirms PDP structural BMPs are designed, constructed, and maintained to remove pollutants.		Current	Continuous
5. Enforce post construction requirements related to new and redevelopment.			
Enforce legal authority to ensure all development projects are in compliance with all post construction requirements.		Current	Continuous
Update county ordinance related to land development; reference to updated BMP manual.		FY 15	One Time

San Diego River Watershed Development Planning Program Strategies	Implementation Timeframe	Frequency
County of San Diego		
Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Current	Continuous
Optional Jurisdictional Strategies		
Investigate feasibility of developing a Green Streets Program.	TBD	TBD
Consider feasibility of developing an alternative compliance program to enable "offsite" compliance for new and redevelopment projects.	TBD	TBD
Investigate feasibility of Land Acquisitions for habitat restoration or preservation.	TBD	TBD
Investigate feasibility of Retrofitting projects in areas of existing development.	TBD	TBD
Consider collaboration with COSD internal departments to leverage mutually beneficial projects to promote retrofits to include installation of controls to address priority pollutants, if feasible.	TBD	TBD
Investigate feasibility of planning for Structural BMPs.	TBD	TBD
Consider the need to plan, design, and conduct environmental review for the following or equivalent structural BMPs to reduce bacteria and other priority pollutants, as needed. <ul style="list-style-type: none"> • SDR WQIP - SDCo-R-01, wet pond/subsurface flow wetland. • SDR WQIP - SDCo-R-02, infiltration basin. • SDR WQIP - SDCo-R-03, enhanced constructed wetland. • SDR WQIP - MJ-R-01, gross solids and trash removal. • SDR WQIP - MJ-R-02, infiltration basin. 	TBD	TBD
Investigate feasibility of Incentives.	TBD	TBD
Investigate feasibility of Detention basins.	TBD	TBD
Investigate feasibility of Treatment systems.	TBD	TBD
Investigate feasibility of Stream, channel, and/or habitat rehabilitation projects.	TBD	TBD

San Diego River Watershed Construction Management Program Strategies County of San Diego	Implementation Timeframe	Frequency
1. Ensure that minimum BMPs are designated and required for construction projects.		
Maintain and update a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities.	FY 16	Quarterly
Implement or require implementation of BMPs that are site specific, seasonally appropriate, and appropriate to the construction phase year round.	TBD	Continuous
Enforce legal authority to ensure inventoried construction projects are in compliance with all requirements.	Current	As Needed
Update county ordinance related to construction; reference to existing grading ordinance	Current	As Needed
Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Current	Continuous
Notify the SDWB by email (Nonfilers_R9waterboards.ca.gov) within five (5) calendar days of issuing escalated enforcement to a construction site that poses a significant threat to water quality as a result of violations or other noncompliance	FY 16	Continuous
Notify the SDWB by email (Nonfilers_R9waterboards.ca.gov) any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances.	FY 16	Continuous
2. Provide enhanced outreach and coordination to convey construction requirements.		
Conduct internal training on Construction Management	Current	Annual

San Diego River Existing Development Management Program Strategies County of San Diego		Implementation Timeframe	Frequency
1. Maintain and improve data tracking methods for existing development inventories where necessary.			
Maintain and update a watershed-based inventory of all existing development that may discharge a pollutant load to and from the MS4.		Current	Annual
Make improvements to tracking watershed based inventories via consolidated database		FY 16	Continuous
Designate a minimum set of BMPs required for all existing development inventories, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.		Current	Continuous
2. Develop and implement approaches to address the impacts of improper water use and irrigation runoff.			
Develop Sustainable Landscapes Program based on available grant funding		FY 16	Continuous
Conduct over irrigation outreach pilot study		Current	One Time
Conduct Homeowners Associations Outreach and Coordination Pilot Study		Current	Continuous
3. Improve and/or continue existing pet waste programs.			
Facilitate pet waste management in county Parks through outreach or bad dispensers.		Current	Continuous
Conduct large residential property pet waste management outreach		Current	Continuous
4. Improve trash management strategies within the watershed.			
Sponsor Trash Collection Events (public outreach/part).		Current	Multiple per Year
5. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
6. Improve and implement existing outreach programs to target key sources and pollutants.			
Create an Equestrian BMP Handbook.		FY 16	One Time
Develop, improve, and distribute outreach materials for existing development.		Current	Continuous
Conduct outreach presentations to elementary, middle, and high school students.		FY 15-16	Multiple per Year
Conduct enhanced outreach to mobile landscaping service providers.		FY 15-16	Continuous
Conduct large property residential pet waste management outreach.		FY 15-16	TBD

San Diego River Existing Development Management Program Strategies	Implementation Timeframe	Frequency
County of San Diego		
Conduct Educational Workshops (e.g., IPM, manure management).	Current	TBD
Conduct Education & Outreach Effectiveness Survey.	Current	Annual
7. Enhance existing Stormwater maintenance programs.		
Operate and maintain (inspect and clean) MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.).	Current	Continuous
Operate and maintain (e.g., inspect, sweep) County maintained streets, unpaved roads, paved roads, and paved highways	Current	Continuous
8. Develop and implement targeted programs to address issues in residential areas.		
Focused residential inspections based on strategic assessments (modeling, MST, persistent flows, regulatory, monitoring data, SFR/MFR (112 RMAs based on HSA).	FY 16	5-year timeframe
Implement a public education and participation program to promote and encourage development of programs, management practices and behaviors that reduce the discharge of pollutants in storm water prioritized by high risk behaviors, pollutants of concern, and target audiences.		
9. Improve existing inspections programs to more efficiently target key sources.		
Conduct inspections of inventoried existing development to ensure compliance.	Current	Per JRMP
Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.).	Current	Annual
10. Actively enforce stormwater and urban runoff requirements for existing development.		
Require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types and pollutant generating activities, as appropriate.	Current	Continuous
Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties.	Current	Continuous
Designate a minimum set of BMPs required for all inventories existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.	Current	One Time
Enforce legal authority to ensure inventoried existing development facilities and/or areas are in compliance with all requirements.	Current	As Needed
Update county ordinance related to existing development; reference	FY 15	One Time

San Diego River Existing Development Management Program Strategies County of San Diego	Implementation Timeframe	Frequency
to existing guidance documents.		
Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Current	Continuous
11. Develop and implement a strategy to identify and facilitate retrofit opportunities in areas of existing development.		
Develop a strategy to identify opportunities and facilitate the implementation of retrofit projects in areas of existing development.	FY 15-16	One Time
Promote and encourage implementation of designated BMPs at residential areas.	FY 16	Continuous
12. Perform strategic monitoring to improve understanding of sources and water quality within the watershed.		
13. Improve coordination between agencies.		
Collaborate with partner agencies and groups to promote incentive programs for BMP retrofits, including rain barrels, smart controllers, soil sensors, turf replacement, etc.	Current	Continuous
Optional Jurisdictional Strategies		
Consider development of incentive programs for water conservation (turf replacement, smart irrigation controllers, irrigation modifications, sustainable landscapes, rain barrels), in collaboration with water agencies and others, to reduce priority pollutants.	TBD	TBD
Investigate the feasibility of developing and implementing an incentive program for BMP Retrofits (Public- Private Partnerships – a County sponsored program to offer incentives for rain barrel installation, downspout disconnects from the stormdrain system, etc.)	TBD	TBD
Consider partnerships with Master Gardeners to provide education opportunities on water use and practices for gardening.	TBD	TBD
Consider collaboration with community groups to provide “boots on the ground” local information to focus implementation efforts on reducing bacteria and other pollutants, close to the source.	TBD	TBD
Consider collaboration with watershed partners to encourage consistent messaging to specific targeted audiences (commercial, residents, and others) to conserve water and mitigate dry weather flows.	TBD	TBD

San Diego River Existing Development Management Program Strategies	Implementation Timeframe	Frequency
County of San Diego		
Investigate the feasibility of improvements to inspections data tracking through mobile phone applications	FY 16	Concurrent with Inspections
Investigate the feasibility of a residential inspections tracking program via mobile platform - miles, violations, etc.	FY 16	Concurrent with Inspections
Develop a strategy to identify candidate areas of existing development for stream, channel, and/or habitat rehabilitation projects and facilitate implementation of such projects.	FY 15	One Time
Develop and implement Stormwater Quality Master Plans for Special Drainage Fee Areas.	Current	Continuous
Consider expanding Homeowners Associations Outreach and Coordination, as needed and as funding is identified.	TBD	TBD
Implement full scale residential pet waste projects (commitments, large property, urban).	TBD	TBD
Consider evaluation and reprioritization of the Agriculture, Weights, and Measures stormwater program to determine inspection priorities for agricultural and related facilities.	TBD	TBD

San Diego River Watershed Optional Strategies

County of San Diego

Consider collaboration with watershed partners on Round 4 of Proposition 84 IRWM grant opportunities to fund targeted educational programs, building of structural controls (brick and mortar projects), or incentive programs to reduce runoff.

Consider collaboration with watershed partners and Regional Water Quality Control Board on effective measures to reduce potential impact of pollutant loads to waterways from unauthorized encampments.

Consider investigating diverting persistent dry weather flows from storm drains to sanitary sewer, where feasible.

Consider the design of structural controls for persistent unpermitted dry weather flows where outreach has been unsuccessful and groundwater or other non-MS4 sources has been ruled out

Consider developing a strategy to evaluate opportunities to naturalize concrete stormwater conveyances, and identify potential funding sources (such as grants) for design and implementation.

Consider collaboration with Caltrans on their implementation of TMDLs at stream reaches on the Caltrans TMDL Prioritization List that are within the County's jurisdiction.

CALTRANS

San Diego River Watershed Illicit Discharge Detection and Elimination Program Strategies Caltrans		Implementation Timeframe	Frequency
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.			
Utilize municipal personnel and contractors to identify and report illicit discharges and connections.		Current	Continuous
Facilitate public reporting of illicit discharges and connections via telephone and email.		Current	Continuous
Coordinate with upstream entities to prevent illicit discharges from upstream sources from entering the MS4.		Current	Continuous
Annual training for appropriate staff on implementation of ICID and Illegal Dumping Response Plan.		FY 15-16	Annual
Develop and implement procedures for educating the public with respect to ICIDs and illegal dumping.		Current	One Time, Continuous
2. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.			
Implement practices and procedures to address spills with the potential to enter the MS4.		Current	Continuous
Investigate and eliminate illicit discharges and connections.		Current	Continuous
3. Actively educate public on prohibitions related to illicit discharges and connections.			
Investigate and eliminate illicit discharges and connections.		Current	Continuous
Optional Jurisdictional Strategies			
Develop and Implement an IC/ID and Illegal Dumping Response Plan		FY 15-16	One Time, Continuous
Develop and implement procedures for investigating, remediating, and eliminating illicit connections and discharges.		Current	One Time, Continuous
Develop and implement procedures for the prevention of illegal dumping.		Current	One Time, Continuous

San Diego River Watershed Development Planning Program Strategies Caltrans		Implementation Timeframe	Frequency
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.			
Stormwater Treatment BMP Technology Report and Stormwater Monitoring and BMP Development Status Report		FY 15-16	One Time/Annual
2. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.			
Implement a program that ensures that all structural BMPs are designed, constructed, and maintained on PDPs.		Current	Continuous
Structural BMPs (which retain water for more than 96 hours) inventory		Current	Annual
Structural BMP inventory (which retain water for more than 96 hours) to California Department of Public Health electronically		Current	Annual
Inspect all high priority structural BMPs.		Current	Annual
3. Enforce post construction requirements related to new and redevelopment.			
Enforce legal authority to ensure all development projects are in compliance with all post construction requirements.		Current	As Needed

San Diego River Watershed Construction Management Program Strategies Caltrans		Implementation Timeframe	Frequency
1. Ensure that minimum BMPs are designated and required for construction projects.			
Implement or require implementation of BMPs that are site specific, seasonally appropriate, and appropriate to the construction phase year round.		Current	Continuous
2. Provide enhanced outreach and coordination to convey construction requirements.			
Provide internal staff training related to construction stormwater management.		Current	Annual
Provide public education and outreach targeting the construction industry.		Current	Continuous
Develop and implement new construction guidance as needed to comply with new Statewide Construction General Permit (CGP)		TBD	As Needed

San Diego River Existing Development Management Program Strategies Caltrans		Implementation Timeframe	Frequency
1. Maintain and improve data tracking methods for existing development inventories where necessary.			
Maintain and update a watershed based inventory of existing development (i.e., commercial, industrial, and municipal facilities and residential areas).		Current	Annual
2. Improve trash management strategies within the watershed.			
Implement "Don't Trash California" campaign.		Current	Continuous
Promote "On the Job with Caltrans Litter Removal" video		Current	Continuous
Implementation of Adopt-A-Highway Statewide Program through coordination with local organizations.		Current	Continuous
Report and evaluate trash and litter activities.		Current	Annual
Implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways.		Current	Continuous
Implement highway maintenance activities as required.		Current	Continuous
3. Improve and implement existing outreach programs to target key sources and pollutants.			
Implement and annually evaluate public education program.		Current	Annual
Co-sponsor CASQA's Water Quality Newsflash		Current	Monthly
Implementation of Statewide Storm Drain Stenciling Program		Current	Continuous
Develop and implement Facility Pollution Prevention Plans via templates and guidance documents.		Current	Continuous
Develop and implement guidance to ensure industrial activities and facilities are covered by the Industrial General Permit as required.		Current	Continuous
Develop and implement a Municipal Coordination Plan		FY 15-16	Continuous
4. Enhance existing MS4 maintenance programs.			
Implement a schedule of operation and maintenance activities for the MS4 and related structures.		Current	Per SWMP
5. Improve existing inspections programs to more efficiently target key sources.			
Conduct inspections of inventoried existing development to ensure compliance. Each area/activity inspected once every five years minimum, with equivalent of 20% of inventory inspected annually.		Current	Per SWMP

San Diego River Existing Development Management Program Strategies Caltrans		Implementation Timeframe	Frequency
6. Identify and facilitate retrofit opportunities in areas of existing development.			
Develop a strategy to identify opportunities and facilitate the implementation of retrofit projects in areas of existing development.		FY 15-16	One Time
Optional Jurisdictional Strategies			
Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties.		Current	Continuous
Implement and evaluate the Vegetation Controls Program		Current	Continuous

CITY OF SAN DIEGO

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
	Jurisdictional Strategies						
	Development Planning						
	All Development Projects						
CSD-1	Establish guidelines and standards for all development projects; provide technical support related to implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area or implement easements to protect water quality, where applicable and feasible.	Refer to JRMP (currently under development).	City-wide	Prior to FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-1.1	Investigation and research of emerging technology.	Annually the Construction & Development Standards Group identifies new tasks to conduct literature review, communication with researchers outside of the City, physical testing and experimentation of new or emerging technologies, and other research with the goal of updating tools available for reducing pollutant loads from development and redevelopment sites.	City-wide	Prior to FY16	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-1.2	Approve and implement a green infrastructure policy.	The City will begin developing a policy in FY16 that will increase the green infrastructure requirements for City CIP projects. This policy will be coordinated with ongoing efforts to update City design manuals and LID design standards for public LID BMPs.	City-wide on public parcels	FY16 (Begin)	As needed	T&SW with DSD and PWD	TBD
CSD-1.3	Develop Design Standards for Public LID BMPs.	Improve quality of design to ensure efficiency and reliability in public designs.	City-wide	FY14-FY15	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-1.4	Outreach to impacted industry regarding minimum BMP requirement updates.	Affects commercial, industrial, and residential development.	City-wide	FY15	As needed	TBD	TBD
CSD-2	Train staff on LID regulatory changes and LID practices.	Formal training is required for all staff involved in development plan review to increase knowledge of LID BMPs. Goal of training associated with LID practices and regulations is to promote LID implementation and to avoid adverse conditions such as trees planted within swales, or planned drainage patterns which obstruct or inhibit LID performance.	City-wide	FY16	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-3	Amend municipal code and ordinances, including zoning ordinances, to facilitate and encourage LID opportunities. Ensure consistency with the City of San Diego's BMP Design Manual. Update the Storm Water Standards Manual accordingly.	Municipal codes and ordinances will be brought to City Council for consideration to encourage LID implementation (e.g., runoff detention and filtration using natural filters and stormwater retention for reuse). LID stormwater management will be encouraged in proposed codes and ordinances associated with development and redevelopment projects, which are brought to City Council for consideration.	City-wide	FY15	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-4	Create a manual that outlines right-of-way design standards.	Create a manual that includes flood control performance standards, permanent BMP elements design standards, design standards for green streets and other BMPs, and maintenance access. Provides drainage and streets design standards. Opportunity to merge various existing manuals and provide consistency.	City-wide	FY15	One time	T&SW with DSD and PWD	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-5	Provide technical education and outreach to the development community on the design and implementation requirements of the MS4 Permit and Water Quality Improvement Plan requirements.	Technical education and outreach to the development community includes outreach on design standards, City design manuals, and the WMAA.	City-wide	Prior to FY16	Ongoing	T&SW with DSD	TBD
	Priority Development Projects (PDPs)						
CSD-6	For PDPs, provide technical support to other City departments to ensure implementation of on-site structural BMPs to control pollutants and manage hydromodification by developing City wide storm water development standards and design guidelines.	Coordinate with other City departments to promote and confirm a thorough understanding of requirements for implementing structural BMPs that control pollutants and manage hydromodification. Included in that understanding are requirements to confirm proper design and construction through processes controlled by other City departments.	City-wide	FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-6.1	Institute a program to verify and enforce maintenance and performance of treatment control BMPs.	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	Refer to JRMP (currently under development).	City-wide	FY15	Every 5 years/ permit cycle	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7.1	Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	Amend BMP Design Manual and zoning standards/requirements which address reduction of pollutants for common areas of trash build-up (e.g. restaurants, supermarkets, "big box" retail stores with food, pet stores). Most effective method for source control of bacteria and trash is to employ four-sized trash enclosures with a cover over trash areas.	City-wide	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7.2	Amend BMP Design Manual for animal-related facilities, such as such as animal shelters, "doggie day care" facilities, veterinary clinics, breeding, boarding and training facilities, groomers, and pet care stores.	Amend BMP Design Manual and zoning requirements (including retrofits) to provide supplemental standards for animal facilities (including animal shelters, dog daycares, veterinary clinics, groomers, pet car stores, and breeding, boarding, and training facilities). Supplemental standards may include requiring covered trash enclosures, identification of landscaped relief areas on site plans, ensuring drainage connections and treatment swales for areas that will not drain to the sanitary sewer, as well as inspection of grading, drainage, and landscaping for outdoor exercise areas.	City-wide	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7.3	Amend BMP Design Manual for nurseries and garden centers.	Amend BMP Design Manual to provide supplemental standards for plant nurseries and garden centers. Standards will focus on reducing irrigation runoff, and loading of sediment, pesticides, and nutrients. Measures may include: covered outdoor storage, green waste management BMPs, improved irrigation efficiency to reduce dry-weather runoff, and containment of runoff from impervious areas where plants and materials are stored.	City-wide	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-7.4	Amend BMP Design Manual for auto-related uses.	Amend BMP Design Manual to provide supplemental standards for automotive-related uses to reduce loading of metals, oils, grease, and trash. Measures may include: four-sized covered trash enclosures, and careful review of auto-related usage areas (e.g. garage bays at repair shops) for grading, drainage, and drain connections to sanitary sewer systems.	City-wide	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-8	Develop and administer an alternative compliance program for on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects). Refer to Section 4.2.5.	Refer to JRMP (currently under development).	City-wide	FY15	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-8.1	Create a fund that allows habitat acquisition, protection enhancement, and restoration in conjunction with other cooperating entities including community groups, academic institutions, state county, and federal agencies, etc.	This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	City-wide	Optional	TBD	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
Construction Management							
CSD-9	Coordinate with other City departments to promote and confirm a thorough understanding of requirements for implementing temporary BMPs that control sediment and other pollutants during the construction phase of projects. Included in that understanding are requirements to inspect at appropriate frequencies and effectively enforce requirements through process controlled by other City departments.	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
Existing Development							
Commercial, Industrial, Municipal, and Residential Facilities and Areas							
CSD-10	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW with DSD, PUD, & PWD	TBD
CSD-10.1	Update minimum BMPs for existing residential, commercial, and industrial development. Specific updates to BMPs include required street sweeping, catch basin cleaning, and maintenance of private roads and parking lots in targeted areas.	Refer to JRMP (currently under development).	City-wide	FY15	Every 5 years	T&SW	TBD
CSD-10.2	Outreach to property managers and trash haulers to elevate the emphasis of power washing as a pollutant source.	Emphasis will be placed on non-compliant washing as an enforceable violation.	City-wide Residential, commercial and industrial areas	FY15	Ongoing	T&SW	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-10.3	Implement property based inspections.	Property-based inspections increase awareness and responsibility for individual properties to tackle issues associated with trash, landscapes, and parking areas. Expanding beyond the business-level inspections will achieve different and more effective opportunities for education, outreach, inspection, and enforcement to encourage water conservation strategies.	City-wide	Prior to FY16	Ongoing	T&SW	TBD
CSD-10.4	Review policies and procedures to ensure discharges from swimming pools meet permit requirements.	Verify and bring to City Council for consideration an update (as needed) for the City's Municipal Code (43.0301) to meet new permit requirements for swimming pool discharges.	City-wide	FY15	As needed	T&SW, City Attorney (Civil & Criminal)	TBD
CSD-11	Promote and encourage implementation of designated BMPs for residential and non-residential areas.	Landscape-based rebates are a "gateway" for adoption of other beneficial practices and are one of the nonstructural methods which address impacts from single-family residential areas (City of San Diego 2011 program development background study). Residential incentives can include: education and training (neighborhood watershed field days), and aggressive subsidies or rebates for grass replacement and rainwater harvesting. Existing programs will be expanded overall, and also have targeted expansion within specific subwatershed, particularly with highest water quality priority conditions.	City-wide Residential and Commercial Areas	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, MWD, CWA & local water agencies	TBD
CSD-11.1	Residential and Commercial BMP: Rain Barrel	The existing PUD rebate program will continue for residential properties and expand for commercial properties for water collection, conservation, and reuse with rain barrels.	City-wide Residential Areas	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.2	Residential and Commercial BMP: Grass Replacement	The existing PUD grass replacement cash rebate program will continue and expand for residential and commercial properties. Program encourages a reduction in water use through the conversion of non-artificial grass to water wise plant material, while maintaining a high level of living landscape to benefit the environment.	City-wide Residential and Commercial Areas	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.3	Residential and Commercial BMP: Downspout Disconnect	Disconnecting downspouts provide alternate runoff pathways from rooftops, sidewalks, driveways, and roads. Disconnecting downspouts from residential areas to pervious land can allow for depression storage and infiltration.	City-wide Residential and Commercial Areas	FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.4	Residential and Commercial BMP: Microirrigation	The existing PUD micro-irrigation rebate program will continue and increase for residential and commercial properties. Application of microirrigation aims to improve the efficiency of landscape irrigation through the precise application of water.	City-wide Residential Areas	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.5	Onsite Water Conservation Survey	Provide free outdoor water conservation surveys to commercial and residential customers to reduce overirrigation and to encourage water conservation.	City-wide Residential and Commercial Areas	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
	MS4 Infrastructure						

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-12	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, channels as allowed by resource agencies, detention basins, etc.) for water quality improvement and for flood control risk management.	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW	TBD
CSD-12.1	Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	In order to limit inflow of pollutants and reduce pollutant loads, proactive measures will be taken to improve, repair, and replace MS4 components. The City of San Diego will start a multi-year program of repairing and replacing storm drain pipes to reduce sediment loading to the MS4. Development of an assessment management program and bond issues will be addressed. Exploration of daylighting pipes will take place where feasible and appropriate.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-13	Coordinate with other City departments (PUD) to implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW with PUD	TBD
CSD-13.1	Identify sewer leaks and areas for sewer pipe replacement prioritization.	Risk assessment to include identifying targeted areas (age, location, proximity to MS4), coming up with methodology, pilot, desktop exercise/analysis.	City-wide	FY16	As needed	T&SW with PUD	TBD
	Roads, Street, and Parking Lots						
CSD-14	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW	TBD
	Pesticide, Herbicides, and Fertilizer BMP Program						
CSD-15	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Refer to JRMP (currently under development).	City-wide	FY16	Ongoing	T&SW with Parks and Rec	TBD
	Retrofit and Rehabilitation in Areas of Existing Development						
CSD-16	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	Refer to JRMP (currently under development). The Offsite Alternative Compliance Program will include methods for identifying and assessing potential retrofit projects in existing development areas. Retrofit project selection will be based upon a variety of factors including proximity to high priority water quality conditions, potential pollutant load removal effectiveness, and feasibility of implementation. The program will include protocols related to funding mechanisms for project construction and long-term maintenance, payment and credit structures, and water quality equivalency standards.	City-wide	TBD	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-17	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	Refer to JRMP (currently under development). The Offsite Alternative Compliance Program will include methods for identifying and assessing potential stream, channel, or habitat rehabilitation projects in existing development areas. Rehabilitation project selection will be based upon a variety of factors including existing stream or habitat degradation, potential future cumulative stream or habitat impacts, and feasibility of implementation. The program will include protocols related to funding mechanisms for project construction and long-term maintenance, payment and credit structures, and water quality equivalency standards.	City-wide	TBD	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
	<i>Illicit Discharge, Detection, and Elimination (IDDE) Program</i>						
CSD-18	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Refer to JRMP (currently under development).	City-wide	Prior to FY16	Ongoing	T&SW	TBD
	<i>Public Education and Participation</i>						
CSD-19	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to JRMP (currently under development).	City-wide	Prior to FY16	Ongoing	T&SW	TBD
CSD-19.1	Continue implementation of a Pet Waste Program.	Pet Waste Program includes outreach on "Scoop the poop", installation of posts for dispensers, distribution of lawn signs, and attendance at dog-related community activities.	City-wide	Prior to FY16	Ongoing	T&SW with Parks and Rec	TBD
CSD-19.2	Promote and encourage implementation of designated BMPs in commercial and industrial areas.	Provide education and outreach on BMPs for commercial businesses and industrial facilities.	City-wide Non-residential Areas	Prior to FY16	Ongoing	T&SW with PUD; Funding: Prop 84 and water districts (MWD)	TBD
CSD-19.3	Expand outreach to homeowners' association (HOA) common lands and HOA incentives.	Approaches to consider include: offering incentives to HOAs and maintenance districts to adopt water-conserving/efficiency and stormwater-reduction changes to their landscapes, irrigation, and maintenance; conducting workshops with property managers; providing supplemental standards, inspection, or enforcement for HOA-managed properties.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-19.4	Develop an outreach and training program for property managers responsible for HOAs and maintenance districts.	Approaches to engage HOAs and property managers include: conducting workshops with property managers, providing supplemental standards, inspections or enforcement around HOA properties, and offering incentives to HOAs and maintenance districts to adopt changes to landscapes, irrigation, or maintenance which promote water conservation or stormwater reduction. Property managers are also a target for enhanced outreach.	City-wide	FY16	Ongoing	T&SW	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-19.5	Enhance and expand trash cleanups through community-based organizations involving target audiences.	Increase effectiveness and reach of trash/beach cleanups and community based efforts by engaging community groups to self-define and carry-out trash clean-ups. Longstanding partnerships and sponsorships with I Love A Clean San Diego and others are recommended to be continued and enhanced. To effectively target stream clean-up efforts, focus on partnerships with community organizations which provide strong engagement with target audiences and communities.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-19.6	Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	Websites will be updated to provide a user-friendly format and clarity for stormwater violations, conditions which citizens can and should report, and how to make such reports. Examples of reports for common incidents will be developed and posted which may vary locally and regionally. Photographs of allowable practices as well as illegal practices should be shown for utmost clarity. Displaying hotline numbers prominently on the website and near the photographs of illegal practices will ensure that those seeking to report will be able to do so easily. Also ensure hotline number and website are searchable and can be retrieved by simple internet searches.	City-wide	Prior to FY16	Ongoing	T&SW	TBD
CSD-19.7	Enhance school and recreation-based education and outreach.	Develop curriculum and establish distribution in public schools. Includes education on water conservation.	City-wide	FY15	Ongoing	T&SW, PUD with community-based organization	TBD
CSD-19.8	Develop education and outreach to reduce irrigation runoff.	Example approaches to reduce or eliminate irrigation runoff may include: education and outreach, prohibition, enhanced enforcement of existing prohibitions, and pilot projects such as the City of Del Mar's pilot door hanger project.	City-wide	Prior to FY16	Ongoing	T&SW with PUD	TBD
CSD-19.9	Develop regional training for water-using mobile businesses.	Consider development of supplemental standards for mobile businesses including: covered trash enclosures, careful review of washing areas (grading, drainage, landscaping, sanitary sewer system connectivity), and appropriate signage (either through zoning for retrofits or "best fix" approaches, or through BMP Design Manual standards). Businesses may include carpet cleaners, tile installers, plumbers, etc.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-19.10	Enhance education and outreach based on results of effectiveness survey and changing regulatory requirements.	Use effectiveness surveys to enhance existing education and outreach programs while proactively keeping up with and incorporating changing regulatory requirements.	City-wide	FY16	Ongoing	T&SW	TBD
Enforcement Response Plan							
CSD-20	Continue to implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Storm Water Code Enforcement Unit's Standard Operating Procedures (SOPs) - Enforcement Response Plan.	Refer to JRMP (currently under development).	City-wide	Prior to FY16	Ongoing	T&SW with PUD, other City enforcement compliance programs	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-20.1	Increase enforcement of irrigation runoff.	Increased enforcement policies against irrigation runoff will be established in tandem with the education and outreach programs on how these actions lead to pollutant loading. By shifting to property-based inspections irrigation runoff can be handled as enforceable violations once the public is well-informed.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-20.2	Increase enforcement of water-using mobile businesses.	In addition to education, pollution associated with mobile business sources can be handled through policy, code development, inspections of business practices, and enforcement.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-21	Increase enforcement of all minimum BMPs for existing residential, commercial, and industrial development.	Increased enforcement of existing development minimum BMPs.	City-wide	FY16	As needed	T&SW	TBD
CSD-22	Increase enforcement associated with property-based inspections.	Shifting inspections from businesses-specific to property-based will increase effectiveness and sense of responsibility and ownership. Education and outreach must be followed up with inspection and enforcement of regulations to encourage proper landscape and water conservation strategies.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-23	Increase enforcement of sweeping and maintenance of private roads and parking lots in targeted areas.	Refer to Minimum BMPs in JRMP.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-24	Increase identification and enforcement of actionable erosion and slope stabilization issues on private property and require stabilization and repair.	Eroding and unstable slope areas on private property (excluding construction sites) will be identified as potential sediment loading sources and subject to enforcement. In the short term, this will target enhanced inspection and enforcement programs to ensure inspectors address erosion and slope instability for the purpose of education.	City-wide	FY16	Ongoing	T&SW	TBD
Additional Nonstructural Strategies							
CSD-25	Conduct a Comprehensive Benefits Analysis to identify benefits other than water quality that are applicable to each of the specific WQIP strategies.	The analysis identifies which other benefits apply to each strategy, and documents the assumptions making those linkages. The delineation of other benefits to strategies includes a general description of each benefit, and a listing of the assumptions that were made to link those benefits to strategies. In addition, the other benefits are characterized with respect to who is directly affected: the city, local residents, local businesses, or visitors. This analysis may be used as part of the adaptive management process to modify future strategies.	City-wide	FY15	One time	T&SW	TBD
CSD-26	Address and clean up trash from transient encampments with collaboration from the Homeless Outreach Team.	Coordinate with the Homeless Outreach Team to respond to transient encampment trash complaints.	City-wide	FY16	Ongoing	T&SW with Police, ESD, Urban Corps, Alpha Project	TBD
CSD-27	Continue participating in source reduction initiatives.	Source reduction initiatives are ultimately the most effective measure to remove pollutants from surface waters, where feasible. Bans or progressive phase-outs that may be considered include: leaf blowers, plastic bags, architectural copper (generally a legacy issue), as well as prohibiting or more aggressively regulating vehicle washing. Additional source reduction initiatives to consider include pesticide sales at hardware stores and irrigation supply stores.	City-wide	Prior to FY16	Ongoing	T&SW	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-27.1	Coordinate with Fleet Services to replace City-owned vehicle brake pads with copper-free brake pads as they become commercially available.	Consider legislative mandate and cooperative implementation of copper-free brake pads on city-owned vehicle to reduce pollutant deposition.	City-wide	FY18	Ongoing	T&SW, ESD with PWD (Fleet Services)	TBD
CSD-28	Proactively monitor for erosion, and complete minor repair and slope stabilization on municipal property.	Actively identify and repair eroding slopes that may be contributing to sediment loading. Prepare an inventory and assessment of eroding areas and their risk to surface waters. Follow assessment with a schedule for ongoing inspection and stabilization (potentially based on a number or percentage of sites annually). Consider Caltrans program as a template.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-29	Conduct special studies.	Special studies will be conducted to gather data to identify pollutant sources, appropriate targets, or other information. Includes collaboration with universities.	City-wide	FY16	Ongoing	T&SW	TBD
CSD-29.1	Participate in Reference Watershed Study.	The San Diego Regional Reference Stream Study (currently being conducted by the Southern California Coastal Water Research Project). The study will develop numeric targets that account for “natural sources” to establish the concentrations or loads from streams in a minimally disturbed or “reference” condition. Refer to Section 5.1 for further details.	Region-wide	Prior to FY16	One time	T&SW, SCCWRP, Regional copermittees	TBD
CSD-29.2	Participate in Reference Beach Study.	The San Diego Regional Reference Beach Study will develop numeric targets that account for “natural sources” to establish the concentrations or loads from the beach in a minimally disturbed or “reference” condition. The purpose of this monitoring program is to advise the public of potential health risks that could occur with water contact recreation at local beaches. DEH will post a health advisory notice or close a beach when FIB results are above REC-1 water quality standards.	Region-wide (San Diego River)	Prior to FY16	One time	T&SW, SCCWRP, Regional copermittees	TBD
CSD-29.3	Conduct a Cost of Service Study.	Conduct a Cost of Service Study that will examine the full cost of flood control and storm water strategies needed to comply with storm water regulations for the City of San Diego. The City of San Diego’s Watershed Asset Management Plan will be used as the basis for the study.	City-wide	FY16	One time	TBD	TBD
CSD-30	Conduct Sustainable Return on Investment (SROI) analysis to estimate strategies’ co-benefits and impacts to the public and the private sector on a common scale.	SROI is an economics-based framework for evaluating quantitative and qualitative performance metrics and monetizing them, if possible, along a triple bottom line (i.e. financial, societal, and environmental). This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	City-wide	Optional	TBD	T&SW and public participation	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-31	Collaborate with the County, if a County-led regional social services effort is established, to provide sanitation and trash management for individuals experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	Support a non-profit or consortium to provide sanitation services associated with hygiene as well as trash management for persons experiencing homelessness. Rented or purchased shower/sanitary trailers providing mobile showers may be organized at specifically scheduled locations and times. This provision has been proposed as a method for preventing surface water usage for sanitation and bathing, as well as opportunity for outreach and referral by social service agencies. The trash management services will include providing trash bags, trash collection areas, and shower/sanitary facilities at centers which provide daytime shelter to their clients, or on a mobile-basis for known transit camps. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	City-wide	Optional	TBD	T&SW	TBD
CSD-32	Participate in an assessment to determine if implementation of an urban tree canopy (UTC) program would benefit water quality and other City goals, where feasible.	Perform a feasibility study to determine if implementing an UTC program would be beneficial to the City's goals. UTC intercepts rainfall through increased coverage of leaves, branches, and stems and reduces runoff from the storm drainage system. Benefits associated with enhancing an UTC include reducing heat island effects and air pollution in addition to aesthetics and community benefits. Where feasible, native trees will be utilized to prevent invasive trees from migrating to open spaces and to conserve water. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	City-wide	Optional	TBD	Planning Dept. with T&SW, SANDAG, and Nature Conservancy	TBD
CSD-33	Conduct a feasibility study to test Permeable Friction Course (PFC), a porous asphalt that overlays impermeable asphalt.	Perform an assessment to determine the feasibility of implementing PFC on City streets. PFC, an overlay of porous asphalt, is an innovative roadway material that improves driving conditions in wet weather and water quality. Placed in a layer 25-50mm thick on top of regular impermeable pavement, PFC allows rainfall to drain within the porous layer rather than on top of the pavement. PFC has also been shown to reduce concentrations of pollutants commonly observed in highway runoff. PFC incorporates stormwater treatment into the roadway surface and does not require additional right-of-way. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	City-wide	Optional	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-34	As opportunities arise and funding sources are identified, protect areas that are functioning naturally by avoiding impervious development and degradation on unpaved open space areas, creating permanent open space protections on undeveloped city-owned land, and accepting privately-owned undeveloped open areas.	This strategy may be implemented if there is interest in participation by the public or private entity with current control of the land. Conditions to be met also include 1) identification of partners, if needed (public, private, non-profit), 2) identification of costs and potential sources of funding, 3) final agreement by public or private entity with current control of the land, 4) final agreement by all other participating partners, 5) funding in place, and 6) if it can be determined that the benefit of preventing increased pollutant loads and minimizing impacts of future growth through land conservation is a more cost effective strategy to meet interim and final numeric goals than other recommended strategies included in this plan (Chesapeake Bay Commission, 2013).	City-wide	Optional	TBD	TBD	TBD
CSD-35	Participate in a watershed council or group if one is established.	This strategy may be triggered as 1) partners have been identified and formal MOUs have been developed and 2) consensus and community support has been achieved.	City-wide	Optional	TBD	TBD	TBD
CSD-36	Prohibit introduction of invasive plants in new development and redevelopment projects.	Coordinate with the City's Development Services Department to continue to prohibit introduction of invasive species such as Arundo donax and Cortaderia selloana for new development or redevelopment projects as specified in the City's municipal code for landscape.	City-wide	Prior to FY16	Ongoing	T&SW with DSD	TBD
	Green Infrastructure						
CSD-37	Bioretention at Allied Gardens Recreation Area.	Bioretention designed for Allied Gardens Recreation Area to treat a 4.5-acre drainage area.	San Diego River WMA	FY16	Ongoing	T&SW with PWD	TBD
CSD-38	Bioretention at Famosa Slough.	Bioretention planned for Famosa Slough to treat a 10.3-acre drainage area.	San Diego River WMA	FY17	Ongoing	T&SW with PWD	TBD
CSD-39	6 Vegetated Swales in Mission Trails Regional Park E. Fortuna Equestrian Staging Area	6 Vegetated Swales planned for Mission Trails Regional Park E. Fortuna Equestrian Staging Area	San Diego River WMA	FY17	Ongoing	T&SW with PWD	TBD
CSD-40	20.1 ac of bioretention have been identified as potential opportunities for green infrastructure implementation on public parcels to treat a 502.5-acre drainage area.	Staggered construction, operation, and maintenance of 20.1 ac of bioretention to treat a 502.5-acre drainage area.	San Diego River WMA	FY22	Ongoing	TBD	TBD
CSD-41	Cabrillo Heights Rain Garden	Rain garden constructed on Kearny Villa Rd. used to treat a 6-acre drainage area.	San Diego River WMA	Prior to FY16	Ongoing	T&SW with PWD	TBD
	Green Streets						
CSD-42	43.61 acres of green streets have been identified as potential opportunities for green street projects to treat a 1090.25-acre drainage area.	Staggered construction, operation and maintenance of 43.61 acres of green streets to treat a 1090.25-acre drainage area.	San Diego River WMA	FY27	Ongoing	TBD	TBD
	Multiuse Treatment Areas						
	Infiltration and Detention Basins						
CSD-43	Cleator Park	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 333 acres of drainage area on 3.8 acres of available space (APN 4491100800). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY19	Ongoing	T&SW with PWD	TBD

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-44	Cabrillo Heights Park	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 238 acres of drainage area on 14 acres of available space (APN 4210500100 and 4213201100). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY19	Ongoing	T&SW with PWD	TBD
CSD-45	Presidio Hills Golf Course and Park	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 142 acres of drainage area on 12 acres of available space (APN 4425200800). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY21	Ongoing	T&SW with PWD	TBD
CSD-46	Montgomery Field Airport	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 410 acres of drainage area on 410 acres of available space (APN 4212901100). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY21	Ongoing	T&SW with PWD	TBD
CSD-47	Ocean Beach Athletic Park and Robb Field	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 315 acres of drainage area on 83 acres of available space (APN 4488000100). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY21	Ongoing	T&SW with PWD	TBD
CSD-48	Lower North Shepherd Canyon	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 757 acres of drainage area on 37 acres of available space (APN 3733022600, 3730715500, and 3733022400). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY24	Ongoing	T&SW with PWD	TBD
CSD-49	Springall Academy	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 324 acres of drainage area on 11 acres of available space (APN 4574000400). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY24	Ongoing	T&SW with PWD	TBD
CSD-50	Serra Mesa Park and upslope canyon	Construction, operation and maintenance of a subsurface detention/infiltration system that would treat about 267 acres of drainage area on 20 acres of available space (APN 4213000700 and 421032200). Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	San Diego River WMA	FY24	Ongoing	T&SW with PWD	TBD
	Stream, Channel and Habitat Rehabilitation Projects						

ID	Strategy	Implementation Approach	Location	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-51	If interim load reduction goals are not met and additional stream, channel, and habitat rehabilitation projects are required, implement as needed.	This strategy may be triggered as 1) funding to address MS4 discharges is identified and secured, 2) staff resources are identified and secured, 3) partners have been identified and formal MOUs have been developed, 4) permits required by regulatory agencies are secured, and 5) This strategy may be triggered as 1) funding to address MS4 discharges is identified and secured, 2) staff resources are identified and secured, 3) partners have been identified and formal MOUs have been developed, 4) permits required by regulatory agencies are secured, 5) consensus and community support has been achieved, and 6) it can be determined that the benefit of preventing increased pollutant loads and minimizing impacts of future growth through land conservation is a more cost effective strategy to meet interim and final numeric goals than other recommended strategies included in this plan (Chesapeake Bay Commission, 2013).	Areas identified during feasibility studies	Optional	TBD	T&SW	TBD
	Water Quality Improvement BMPs						
	Proprietary BMPs						
CSD-52	3 Drain Inserts in Complex Street Green Mall.	3 drainage inserts planned for implementation in Complex Street Green Mall.	San Diego River WMA	FY17	Ongoing	T&SW with PWD	TBD
CSD-53	Park Ridge hydrodynamic separator	A hydrodynamic separator used to treat onsite runoff of 37.6 acres.	San Diego River WMA	FY17	Ongoing	T&SW with PWD	TBD
CSD-54	El Capitan Reservoir	3 drainage inserts planned for implementation in El Capitan Reservoir.	San Diego River WMA	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-55	Murray Reservoir	5 drainage inserts planned for implementation in Murray Reservoir.	San Diego River WMA	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-56	San Vicente Reservoir	1 drainage insert planned for implementation in San Vicente Reservoir.	San Diego River WMA	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-57	Serra Mesa/Kearny Mesa Library	A hydrodynamic separator used to treat onsite runoff at Serra Mesa/Kearny Mesa Library.	San Diego River WMA	Prior to FY16	Ongoing	T&SW with PWD	TBD
	Dry Weather Flow Separation and Treatment Projects						
CSD-58	If interim load reduction goals are not met and additional dry weather flow separation and treatment projects are required, implement as needed.	Construction of dry weather flow separation and treatment projects, where identified. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, and 4) permits required by regulatory agencies are secured.	Downstream reaches where persistent dry weather flows have been observed	Optional	TBD	T&SW with PWD	TBD
	Trash Segregation						
CSD-59	If interim load reduction goals are not met and additional trash segregation projects are required, implement as needed.	Construction of trash segregation (Trash Guards, etc.) projects, where identified. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, and 4) permits required by regulatory agencies are secured.	High-loading areas city-wide	Optional	TBD	T&SW with PWD	TBD

DSD= Development Services Department; PUD = Public Utilities Department; PWD = Public Works Department; T&SW = Transportation and Storm Water Division; WAMP = Watershed Asset Management Plan; “Refer to Section X” will be updated upon submittal of the City’s JRMP in June 2015; TBD = will be determined during the next fiscal year.

Table 2. City of San Diego Annual Schedule

Construction																								
Ongoing Implementation/ O&M																								
As needed/Design																								
ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
Jurisdictional Strategies																								
Development Planning																								
All Development Projects																								
CSD-1	Establish guidelines and standards for all development projects; provide technical support related to implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area or implement easements to protect water quality, where applicable and feasible.	City-wide	Prior to FY16	Ongoing																				
CSD-1.1	Investigation and research of emerging technology.	City-wide	Prior to FY16	As Needed																				
CSD-1.2	Approve and implement a green infrastructure policy.	City-wide on public parcels	FY16 (Begin)	As Needed																				
CSD-1.3	Develop Design Standards for Public LID BMPs.	City-wide	FY14-FY15	As Needed																				
CSD-1.4	Outreach to impacted industry regarding minimum BMP requirement updates.	City-wide	FY15	As Needed																				
CSD-2	Train staff on LID regulatory changes and LID practices.	City-wide	FY16		As Needed																			
CSD-3	Amend municipal code and ordinances, including zoning ordinances, to facilitate and encourage LID opportunities. Ensure consistency with the City of San Diego's BMP Design Manual. Update the Storm Water Standards Manual accordingly.	City-wide	FY15	As Needed																				
CSD-4	Create a manual that outlines right-of-way design standards.	City-wide	FY15	One time																				
CSD-5	Provide technical education and outreach to the development community on the design and implementation requirements of the MS4 Permit and Water Quality Improvement Plan requirements.	City-wide	Prior to FY16	Ongoing																				
Priority Development Projects (PDPs)																								
CSD-6	For PDPs, provide technical support to other City departments to ensure implementation of on-site structural BMPs to control pollutants and manage hydromodification by developing City wide storm water development standards and design guidelines.	City-wide	FY16		Ongoing																			

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-6.1	Institute a program to verify and enforce maintenance and performance of treatment control BMPs.	City-wide	FY16		Ongoing																			
CSD-7	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	City-wide	FY15	Cycle																				
CSD-7.1	Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	City-wide	FY15	One time																				
CSD-7.2	Amend BMP Design Manual for animal-related facilities, such as animal shelters, "doggie day care" facilities, veterinary clinics, breeding, boarding and training facilities, groomers, and pet care stores.	City-wide	FY15	One time																				
CSD-7.3	Amend BMP Design Manual for nurseries and garden centers.	City-wide	FY15	One time																				
CSD-7.4	Amend BMP Design Manual for auto-related uses.	City-wide	FY15	One time																				
CSD-8	Develop and administer an alternative compliance program for on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects). Refer to Section 4.2.5.	City-wide	FY15	Ongoing																				
CSD-8.1	Create a fund that allows habitat acquisition, protection enhancement, and restoration in conjunction with other cooperating entities including community groups, academic institutions, state county, and federal agencies, etc.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
	Construction Management																							
CSD-9	Coordinate with other City departments to promote and confirm a thorough understanding of requirements for implementing temporary BMPs that control sediment and other pollutants during the construction phase of projects. Included in that understanding are requirements to inspect at appropriate frequencies and effectively enforce requirements through process controlled by other City departments.	City-wide	FY16		Ongoing																			
	Existing Development																							
	Commercial, Industrial, Municipal, and Residential Facilities and Areas																							
CSD-10	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	City-wide	FY16		Ongoing																			

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-10.1	Update minimum BMPs for existing residential, commercial, and industrial development. Specific updates to BMPs include required street sweeping, catch basin cleaning, and maintenance of private roads and parking lots in targeted areas.	City-wide	FY15	Cycle																				
CSD-10.2	Outreach to property managers and trash haulers to elevate the emphasis of power washing as a pollutant source.	City-wide Residential, commercial and industrial areas	FY15	Ongoing																				
CSD-10.3	Implement property based inspections.	City-wide	Prior to FY16	Ongoing																				
CSD-10.4	Review policies and procedures to ensure discharges from swimming pools meet permit requirements.	City-wide	FY15	As Needed																				
CSD-11	Promote and encourage implementation of designated BMPs for residential and non-residential areas.	City-wide Residential and Commercial Areas	Prior to FY16	Ongoing																				
CSD-11.1	Residential and Commercial BMP: Rain Barrel	City-wide Residential Areas	Prior to FY16	Ongoing																				
CSD-11.2	Residential and Commercial BMP: Grass Replacement	City-wide Residential and Commercial Areas	Prior to FY16	Ongoing																				
CSD-11.3	Residential and Commercial BMP: Downspout Disconnect	City-wide Residential and Commercial Areas	FY16		Ongoing																			
CSD-11.4	Residential and Commercial BMP: Microirrigation	City-wide Residential Areas	Prior to FY16	Ongoing																				
CSD-11.5	Onsite Water Conservation Survey	City-wide Residential and Commercial Areas	Prior to FY16	Ongoing																				
	MS4 Infrastructure																							
CSD-12	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, channels as allowed by resource agencies, detention basins, etc.) for water quality improvement and for flood control risk management.	City-wide	FY16		Ongoing																			

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-12.1	Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	City-wide	FY16		Ongoing																			
CSD-13	Coordinate with other City departments (PUD) to implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	City-wide	FY16		Ongoing																			
CSD-13.1	Identify sewer leaks and areas for sewer pipe replacement prioritization.	City-wide	FY16		As Needed																			
	Roads, Street, and Parking Lots																							
CSD-14	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways	City-wide	FY16		Ongoing																			
	Pesticide, Herbicides, and Fertilizer BMP Program																							
CSD-15	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	City-wide	FY16		Ongoing																			
	Retrofit and Rehabilitation in Areas of Existing Development																							
CSD-16	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	City-wide	TBD																					
CSD-17	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	City-wide	TBD																					
	Illicit Discharge, Detection, and Elimination (IDDE) Program																							
CSD-18	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	City-wide	Prior to FY16	Ongoing																				
	Public Education and Participation																							
CSD-19	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	City-wide	Prior to FY16	Ongoing																				
CSD-19.1	Continue implementation of a Pet Waste Program.	City-wide	Prior to FY16	Ongoing																				
CSD-19.2	Promote and encourage implementation of designated BMPs in commercial and industrial areas.	City-wide Non-residential Areas	Prior to FY16	Ongoing																				

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-19.3	Expand outreach to homeowners' association (HOA) common lands and HOA incentives.	City-wide	FY16		Ongoing																			
CSD-19.4	Develop an outreach and training program for property managers responsible for HOAs and maintenance districts.	City-wide	FY16		Ongoing																			
CSD-19.5	Enhance and expand trash cleanups through community-based organizations involving target audiences.	City-wide	FY16		Ongoing																			
CSD-19.6	Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	City-wide	Prior to FY16	Ongoing																				
CSD-19.7	Enhance school and recreation-based education and outreach.	City-wide	FY15	Ongoing																				
CSD-19.8	Develop education and outreach to reduce irrigation runoff.	City-wide	Prior to FY16	Ongoing																				
CSD-19.9	Develop regional training for water-using mobile businesses.	City-wide	FY16		Ongoing																			
CSD-19.10	Enhance education and outreach based on results of effectiveness survey and changing regulatory requirements.	City-wide	FY16		Ongoing																			
Enforcement Response Plan																								
CSD-20	Continue to implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Storm Water Code Enforcement Unit's Standard Operating Procedures (SOPs) - Enforcement Response Plan.	City-wide	Prior to FY16	Ongoing																				
CSD-20.1	Increase enforcement of irrigation runoff.	City-wide	FY16		Ongoing																			
CSD-20.2	Increase enforcement of water-using mobile businesses.	City-wide	FY16		Ongoing																			
CSD-21	Increase enforcement of all minimum BMPs for existing residential, commercial, and industrial development.	City-wide	FY16		As needed																			
CSD-22	Increase enforcement associated with property-based inspections.	City-wide	FY16		Ongoing																			
CSD-23	Increase enforcement of sweeping and maintenance of private roads and parking lots in targeted areas.	City-wide	FY16		Ongoing																			
CSD-24	Increase identification and enforcement of actionable erosion and slope stabilization issues on private property and require stabilization and repair.	City-wide	FY16		Ongoing																			
Additional Nonstructural Strategies																								
CSD-25	Conduct a Comprehensive Benefits Analysis to identify benefits other than water quality that are applicable to each of the specific WQIP strategies.	City-wide	FY15	One time																				

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-26	Address and clean up trash from transient encampments with collaboration from the Homeless Outreach Team.	City-wide	FY16		Ongoing																			
CSD-27	Continue participating in source reduction initiatives.	City-wide	Prior to FY16	Ongoing																				
CSD-27.1	Coordinate with Fleet Services to replace City-owned vehicle brake pads with copper-free brake pads as they become commercially available.	City-wide	FY18				Ongoing																	
CSD-28	Proactively monitor for erosion, and complete minor repair and slope stabilization on municipal property.	City-wide	FY16		Ongoing																			
CSD-29	Conduct special studies.	City-wide	FY16		Ongoing																			
CSD-29.1	Participate in Reference Watershed Study.	Region-wide	Prior to FY16	One time																				
CSD-29.2	Participate in Reference Beach Study.	Region-wide (San Diego River)	Prior to FY16	One time																				
CSD-29.3	Conduct a Cost of Service Study.	City-wide	FY16		One time																			
CSD-30	Conduct Sustainable Return on Investment (SROI) analysis to estimate strategies' co-benefits and impacts to the public and the private sector on a common scale.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
CSD-31	Collaborate with the County, if a County-led regional social services effort is established, to provide sanitation and trash management for individuals experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
CSD-32	Participate in an assessment to determine if implementation of an urban tree canopy (UTC) program would benefit water quality and other City goals, where feasible.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
CSD-33	Conduct a feasibility study to test Permeable Friction Course (PFC), a porous asphalt that overlays impermeable asphalt.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
CSD-34	As opportunities arise and funding sources are identified, protect areas that are functioning naturally by avoiding impervious development and degradation on unpaved open space areas, creating permanent open space protections on undeveloped city-owned land, and accepting privately-owned undeveloped open areas.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
CSD-35	Participate in a watershed council or group if one is established.	City-wide	Optional												If triggered, begin planning, acquiring funding and resources									
CSD-36	Prohibit introduction of invasive plants in new development and redevelopment projects.	City-wide	Prior to FY16	Ongoing																				
	Green Infrastructure																							

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-37	Bioretention at Allied Gardens Recreation Area.	San Diego River WMA	FY16																					
CSD-38	Bioretention at Famosa Slough.	San Diego River WMA	FY17																					
CSD-39	6 Vegetated Swales in Mission Trails Regional Park E. Fortuna Equestrian Staging Area	San Diego River WMA	FY17																					
CSD-40	20.1 ac of bioretention have been identified as potential opportunities for green infrastructure implementation on public parcels to treat a 502.5-acre drainage area.	San Diego River WMA	FY22																					
CSD-41	Cabrillo Heights Rain Garden	San Diego River WMA	Prior to FY16																					
	Green Streets																							
CSD-42	43.61 acres of green streets have been identified as potential opportunities for green street projects to treat a 1090.25-acre drainage area.	San Diego River WMA	FY27																					
	Multiuse Treatment Areas																							
	Infiltration and Detention Basins																							
CSD-43	Cleator Park	San Diego River WMA	FY19																					
CSD-44	Cabrillo Heights Park	San Diego River WMA	FY19																					
CSD-45	Presidio Hills Golf Course and Park	San Diego River WMA	FY21																					
CSD-46	Montgomery Field Airport	San Diego River WMA	FY21																					
CSD-47	Ocean Beach Athletic Park and Robb Field	San Diego River WMA	FY21																					
CSD-48	Lower North Shepherd Canyon	San Diego River WMA	FY24																					
CSD-49	Springall Academy	San Diego River WMA	FY24																					
CSD-50	Serra Mesa Park and upslope canyon	San Diego River WMA	FY24																					
	Stream, Channel and Habitat Rehabilitation Projects																							
CSD-51	If interim load reduction goals are not met and additional stream, channel, and habitat rehabilitation projects are required, implement as needed.	Areas identified during feasibility studies	Optional												If triggered, begin planning (acquire funding and resources, conduct site feasibility analysis and site selection) to implement rehabilitation projects.									
	Water Quality Improvement BMPs																							
	Proprietary BMPs																							

ID	Strategy	Location	Implementation or Construction Year Start	FY 15 and Earlier	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33	FY 34	FY 35
CSD-52	3 Drain Inserts in Complex Street Green Mall.	San Diego River WMA	FY17																					
CSD-53	Park Ridge hydrodynamic separator	San Diego River WMA	FY17																					
CSD-54	El Capitan Reservoir	San Diego River WMA	Prior to FY16																					
CSD-55	Murray Reservoir	San Diego River WMA	Prior to FY16																					
CSD-56	San Vicente Reservoir	San Diego River WMA	Prior to FY16																					
CSD-57	Serra Mesa/Kearny Mesa Library	San Diego River WMA	Prior to FY16																					
	Dry Weather Flow Separation and Treatment Projects																							
CSD-58	If interim load reduction goals are not met and additional dry weather flow separation and treatment projects are required, implement as needed.	Downstream reaches where persistent dry weather flows have been observed	Optional												If triggered, begin planning (acquire funding and resources, conduct site feasibility analysis and site selection) to implement dry weather flow separation projects.									
	Trash Segregation																							
CSD-59	If interim load reduction goals are not met and additional trash segregation projects are required, implement as needed.	High-loading areas city-wide	Optional												If triggered, begin planning (acquire funding and resources, conduct site feasibility analysis and site selection) to implement trash segregation projects.									

B.3 CHAPTER APPENDIX B – WET WEATHER BASELINE LOADS QUANTIFICATION METHODS & VALUES

For the Cities of El Cajon, La Mesa, Santee, and the County of San Diego, wet weather baseline loads for fecal coliform¹ were established using the Structural BMP Prioritization and Analysis Tool (SBPAT); a GIS-based water quality analysis tool used to quantify benefits, costs, uncertainties and potential risks associated with storm water quality projects.

For the City of San Diego, the model used incorporates a watershed loading model to estimate baseline water quality and flow conditions, a site-scale BMP optimization model, and a non-linear watershed-scale optimization model to assist with evaluating multiple BMP scenarios concurrently. The modeling approach builds on the information and modeling efforts that were completed during Phase I CLRP development. Existing Loading Simulation Program in C++ (LSPC) watershed models were updated and standardized in Phase II to (1) establish a level of consistency and comparability for areas with similar physical characteristics, and (2) provide reasonable assurance that the modeled existing condition is a representative baseline condition.

CITIES OF EL CAJON, LA MESA, SANTEE, AND THE COUNTY OF SAN DIEGO

The quantification/analysis module utilizes a stochastic Monte Carlo method to model water quality based on land use Event Mean Concentrations (EMCs)² coupled with continuous hydrologic simulations (produced using the USEPA SWMM model) to calculate annual loads. Since the previously established target load reductions (TLRs) from the Phase II CLRP which are used for this WQIP were developed using data from Water Year (WY) 2003, considered an average rainfall year for the Watershed, the WQIP analysis was also developed using rainfall from WY 2003 to maintain consistency. Several additional calibration checks were performed on the SBPAT model to evaluate its consistency with the Loading Simulation Program in C++ (LSPC) model that was used to develop the target load reductions. Specifically, water quality and hydrologic input parameters were evaluated, and these parameters were adjusted where warranted as described below.

INPUT PARAMETER UPDATES SINCE CLRP DEVELOPMENT

Land use EMCs for modeled pollutants selected for WQIP analysis were developed for the San Diego River (SDR) Watershed using storm water monitoring data collected by 1) the City of San Diego solely, and 2) the County of San Diego and the Copermittees of the San Diego Municipal Storm Water Permit as a group. The mean statistics were estimated using San Diego County datasets, but in order to develop more robust variability estimates, the standard deviation statistics were

¹ Fecal coliform is utilized as a surrogate for all FIB since there is an acceptable database of both land use-based storm water concentrations and structural BMP performance for this constituent.

² An EMC is an *average* pollutant concentration for a storm water event, whereas instantaneous concentrations throughout a storm are more variable. Land use specific EMC data are used to in watershed models to characterize pollutant concentrations from different catchments which are comprised of various land use mixes.

estimated using the coefficients of variation³ from the Los Angeles County SBPAT default datasets, which have larger numbers of samples. For pollutants where no San Diego County specific EMC data were available, SBPAT default EMC statistics were used.

Since the San Diego County EMC datasets were based on fewer storms, smaller drainage areas (and therefore a smaller diversity of sites within each land use category) and were collected over a three month period of time within a single season, they may not adequately capture the full variability across multiple storm sizes, antecedent conditions, and wet seasons. In order to address this issue for the WQIP analysis, fecal coliform (FC) land use EMCs were compared with the FC land use EMCs developed for other Southern California-based TMDL compliance plans (Beach Cities WMG 2014). When arithmetic estimates of the log mean differed by more than an order of magnitude, they were compared with arithmetic mean land use concentrations from the LSPC model calibrated for the San Diego Region, and the EMC statistics from the two datasets that were closer to LSPC's arithmetic means (calculated based on land use loads divided by runoff volumes) were selected for use in this WQIP analysis. This resulted in changes to commercial and open space FC EMCs. Table B3 below provides the old and new arithmetic estimates of log mean and log standard deviation for the two land uses and Table B1 below provides the EMCs for all land uses and pollutants used in the WQIP analysis.

³ Coefficient of variation = standard deviation divided by the mean

Table B1. Proposed SBPAT EMCs for SLR and SDR Watersheds – Arithmetic Estimates of the Lognormal Summary Statistics (means with standard deviations in parentheses)

Land Use	TSS	TP	DP	NH3	NO3	TKN	Diss Cu	Tot Cu	Tot Pb	Diss Zn	Tot Zn	Fecal Col.
Rural Residential	2,523.76 (3,757.19)	1.59 (1.19)	0.12 (0.08)	0.11 (0.14)	1.50 (3.40)	2.65 (2.45)	4.20 (4.02)	8.36 (5.99) ¹	21.38 (31.41)	14.99 (30.63)	39.19 (34.01) ¹	6,684 (20,245)
Orchard	252.64 (163.89)	0.36 (0.16)	0.13 (0.10)	0.04 (0.04)	26.11 (88.27)	2.31 (1.09)	22.50 (17.50)	100.10 (74.8)	30.20 (34.30)	40.10 (49.10)	274.80 (147.30)	1,344 (3,410)
Single Family Residential	123.41 (183.72)	0.49 (0.37)	0.45 (0.29)	0.49 (0.64)	1.58 (3.59)	2.51 (2.33)	11.42 (10.93)	25.96 (18.6)	13.03 (19.15)	50.02 (102.22)	153.29 (133.04)	35,557 (107,700)
Commercial	127.68 (89.75)	0.32 (0.27)	0.29 (0.25)	1.21 (4.18)	0.55 (0.55)	3.44 (4.78)	16.62 (13.78)	54.84 (44.88)	14.40 (39.60)	224.40 (140.58)	483.7 (306.62)	51,600 (173,400)
Industrial	125.18 (118.15)	0.45 (0.47)	0.26 (0.25)	0.6 (0.95)	0.87 (0.96)	2.87 (2.33)	21.35 (20.78)	53.54 (56.95)	20.52 (58.92)	214.58 (271.47)	428.39 (388.85)	26,703 (34,515)
Education (Municipal)	132.11 (162.75)	0.46 (0.26)	0.26 (0.2)	0.4 (0.99)	0.61 (0.67)	1.71 (1.13)	5.58 (5.03)	12.02 (8.21)	7.43 (10.11)	73.13 (50.73)	174.1 (123.02)	2,148 (6,506) ²
Transportation	77.80 (83.80)	0.68 (0.94)	0.56 (0.82)	0.37 (0.68)	0.74 (1.05)	1.84 (1.44)	32.40 (25.5)	52.20 (37.5)	9.20 (14.5)	222 (201.7)	292.90 (215.8)	1,680 (456)
Multi-family Residential	39.90 (51.3)	0.23 (0.21)	0.20 (0.19)	0.50 (0.74)	1.51 (3.06)	1.80 (1.24)	7.40 (5.70)	12.10 (5.60)	4.50 (7.80)	77.5 (84.1)	125.10 (101.10)	11,800 (23,700)
Agriculture (row crop)	999.2 (648.2)	3.34 (1.53)	1.41 (1.04)	1.65 (1.67)	34.40 (116.30)	7.32 (3.44)	22.50 (17.50)	100.10 (74.8)	30.20 (34.3)	40.10 (49.10)	274.80 (147.30)	60,300 (153,000)
Vacant / Open Space	216.60 (1482.8)	0.12 (0.31)	0.09 (0.27)	0.11 (0.25)	1.17 (0.79)	0.96 (0.9)	0.60 (1.90)	10.60 (24.4)	3.00 (13.10)	28.10 (12.90)	26.30 (69.50)	484 (806)

¹ SBPAT default SFR dissolved:total concentration ratio was applied to the Blossom Valley dissolved mean value to estimate Blossom Valley total mean value

² FC EMC COV is based on SFR SCCWRP datasets

Mean EMCs in shaded area are based on LA region default SBPAT datasets due to a lack of available San Diego data

Mean EMCs shaded in orange are updated for this WQIP

SBPAT's predicted annual discharge volume for WY 2003 was evaluated by comparing it with LSPC's prediction as well as a measured value based on the stream flow gauge on San Diego River at Fashion Valley (USGS 11023000). These values are shown in Table B2 below. SBPAT's saturated hydraulic conductivity (K_{sat}) and initial moisture deficit input parameter values were adjusted upward to their maximum values (within their reasonable ranges as reported in USDA (1996)) to decrease predicted runoff volumes to better match the measured volume. The revised SBPAT volume, also shown in Table B2, is within 20% of the measured volume and 30% of the LSPC predicted volume.

Table B2. Observed and modeled runoff volumes for WY 2003 at Fashion Valley stream flow gage

Analysis	WY 2003 Total Runoff (acre-feet)
USGS 1102300 stream flow gage at Fashion Valley on San Diego River ¹	20,000
Phase II LSPC model (with irrigation turned off)	18,700
SBPAT model prior to adjustments	28,100
SBPAT model after adjustments	24,000

¹ Dry weather flows were removed from analysis.

Table B3. Updated FC land use EMCs - Arithmetic Estimates of the Lognormal Summary Statistics (means with standard deviations in parentheses)

Land Use	CLRP EMC	WQIP EMC
Commercial	791 [22,846]	51,600 ¹ [173,400]
Open Space	6,310 [1,310]	484 ² [806]

¹ Commercial fecal coliform EMC based on 2000-2005 SCCWRP Los Angeles region land use data (SCCWRP, 2007b). This EMC dataset is summarized in the SBPAT User's Guide (Geosyntec, 2012).

² Open space fecal coliform EMC statistics based on *E. coli* data (divided by 0.85 to adjust to fecal coliform) for Arroyo Sequit reference watershed, or 11 samples collected between December 2004 and April 2006. Data used by LA Regional Board for creek bacterial TMDLs and taken from (SCCWRP, 2005) and (SCCWRP, 2007a).

Once the parameter adjustments described above were made, SBPAT's predicted annual FC load was divided by the SBPAT predicted annual volume to determine the corresponding average annual FC concentration at the watershed outlet for WY 2003. SBPAT's average concentration at the catchment outlets was then adjusted to account for effects of instream die-off in order to compare this predicted concentration with measured concentration. The adjustment factor was developed using the LSPC model by turning the die-off on and off. This adjusted SBPAT average concentration was compared with a corresponding value from the LSPC model (with die-off turned on), and with an arithmetic mean of measured concentration data taken from the SDR mass loading monitoring station (MLS) for the entire record (n=23, POR=2001-12). These values are shown in Table B4.

Table B4. FC concentration comparison

Dataset	Average FC Concentration (90% Confidence Interval in Parentheses) (MPN/100ml)
Measured data at SDR MLS (n=23, POR=2001-12)	15,400 (6,200 – 24,600)
LSPC model for WY 2003	6,600
SBPAT model for WY 2003 (adjusted with instream die-off for comparison)	23,800

Both LSPC and SBPAT's average concentration for the watershed outlet are within the 90% confidence interval of the measured data. Therefore, SBPAT's predicted annual load (where load is the product of volume and concentration, both of which were individually compared with measured data) is considered reliable for the purpose of this watershed analysis.

BASELINE LOAD CREDIT FOR IMPLEMENTED DEVELOPMENT BMPs

Baseline loads assume 2009 land uses, therefore they include loads from development that occurred between the TMDL year (2003) and 2009. As such, structural BMPs that were implemented on development projects between the TMDL year (2003) and 2009 were considered as part of the overall pollutant load reduction achieved by the WQIP. Appendix E presents a list of these projects, a map with their locations, and describes how these features were modeled. It should be noted that no credit is given for BMPs to be implemented as mitigation to new development after 2009 as it is assumed that the loads mitigated by the BMPs will offset the additional loads generated by new development (i.e. no net decrease in pollutant load).

BASELINE LOAD BREAKDOWN

Figure B1 shows the estimated modeled breakdown of San Diego River wet weather watershed loads by jurisdiction. For the purposes of the baseline loading analysis, as well as subsequent BMP implementation analyses presented in this WQIP, land use loads attributable to federal and tribal land ownership are not considered part of the Participating Agencies' load since the Participating Agencies do not have jurisdiction over these lands. Similarly, loading from agricultural land uses is not considered part of the Participating Agencies' load because the TMDL identifies Conditional Waivers of Waste Discharge Requirements as the mechanism to address discharges from controllable non-point sources (SDRWQCB 2010, p. A47). Open space loading is also shown as a separate category here, consistent with the TMDL. However, it should be noted that this general land use category includes parks and other undeveloped areas that are located within the Participating Agencies' jurisdictional areas and that drain to or through the MS4s.

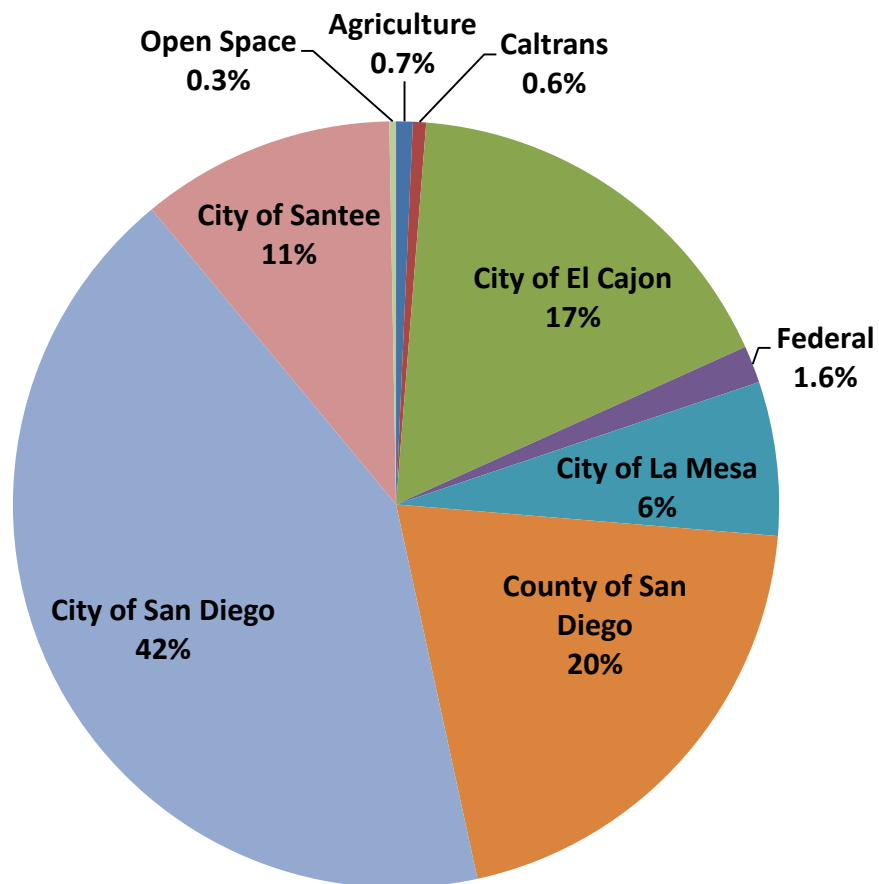


Figure B1. Wet weather FC modeled loads in the San Diego River Watershed, by land use/jurisdictional category, water year 2003

DETERMINATION OF TMDL REDUCTION OBJECTIVES

The first step in the load reduction analysis is the interpretation of the TMDLs and their associated numeric goals and WLAs and applying the watershed model for determining necessary pollutant load reductions to meet those objectives. Numeric goals were calculated for each parameter based on the difference between the modeled load and calculated TMDL load for Water Year (WY) 2003. This year represents typical wet and dry weather conditions and provides an appropriate benchmark to use in defining numeric goals and the resulting BMP implementation needs. Modeled loads above the TMDL load were considered as a required reduction and subtracted from the model baseline load to develop an instream load reduction target.

Each parameter has special considerations based on how the Basin Plan Water Quality Objectives (WQOs) are expressed as well as the associated TMDL requirements, and other regulatory requirements. Key compliance elements and the calculated numeric goals and reduction targets are presented in the following sections.

WQOS AND TMDL NUMERIC TARGETS

The Bacteria TMDL is expressed as both a concentration-based and load-based target. Determination of MS4 compliance, as described in the Basin Plan Amendment, is based on both receiving water conditions and measurements of bacteria loading from MS4 outfalls. The concentration-based receiving water component of the TMDL is reflected by the TMDL targets, which are separated into a dry weather component, based on the geometric mean WQOs, and a wet weather component, based on the single sample WQOs. These targets are used to generate “Receiving Water Limitations” in the TMDL, which means the MS4s are assigned much of the responsibility for attaining the TMDL targets (or, at a minimum, demonstrating that non-MS4 sources are responsible for non-attainment). The San Diego River watershed is subject to those targets assigned to freshwater creeks.

Fecal coliform was used to represent bacteria in the load reduction calculations. The TMDL load for fecal coliform was calculated by multiplying the WQOs by the daily modeled stream flow. Modeled daily loads greater than this threshold were flagged as an exceedance. Modeled daily loads were also classified as occurring on either wet days or dry days because of different compliance requirements. A wet day is defined as a day with at least 0.2 inch of rainfall plus the three following days. Any day not classified as a wet day was considered a dry day. For wet weather, the Bacteria TMDL specifies an allowable exceedance frequency of 22 percent based on reference conditions, while no exceedances are allowed during dry weather. For WY2003, the number of wet days was 42, therefore the number of allowable wet weather exceedance days was 9 (rounded). The allowable exceedance load for wet weather was calculated by summing the top 9 days with the highest modeled daily loads. This load was then subtracted from the modeled wet weather total for the year. The difference between the remaining modeled load and the TMDL load represents the load reduction required for wet weather.

For dry weather, the WQOs represent 30-day geometric mean concentrations that require interpretation for use in developing the associated TMDL load. For the CLRP, a 30-day period in July 2003 was selected for modeling the dry period as it best represents a period unimpacted by rainfall and dominated by dry urban runoff. The 30-day geometric mean concentrations for each parameter were assumed for each dry day during this period and multiplied by the daily modeled flows to calculate the TMDL load. The dry weather load

reduction was simply the difference between the modeled existing load and the TMDL load for the total number of dry days.

TMDL LOAD REDUCTION SUMMARY

Table B5 presents the calculated wet loads and load reductions required based on the assumptions discussed above. The critical bacteria constituent is fecal coliform bacteria based on wet weather conditions. The assumption used in the CLRP is that by focusing on the critical pollutants for load reduction analyses, other pollutants will be addressed (many of the BMPs address multiple pollutants). Regardless, load reductions for the other pollutants are verified later in the analysis to ensure that necessary reductions are demonstrated.

Table B5. Wet-weather pollutant loads and required reductions

Pollutant	Total Load	Non-Exceedance Load	Allowable Exceedance Load	Exceedance Load	Required Reduction
Fecal Coliform (Billion #/year)	1,494,873	64,568	912,229	518,076	34.7%
Enterococcus (Billion #/year)	10,734,720	65,267	7,643,082	3,026,371	28.2%

B.3 CHAPTER APPENDIX C - WET WEATHER NON-STRUCTURAL BMP DESCRIPTIONS AND LOAD REDUCTION QUANTIFICATIONS, METHODS, AND CALCULATIONS

Non-structural BMPs are management programs or activities designed to reduce or eliminate pollutant loading by addressing its source. The quantification methods differed slightly between the City of San Diego and the Cities of El Cajon, La Mesa, and Santee and the County of San Diego. The methods and results are described separately in this appendix.

CITIES OF EL CAJON, LA MESA, AND SANTEE AND THE COUNTY OF SAN DIEGO

To ensure that non-structural BMPs target the most significant sources of bacteria, the following factors were considered: (1) a sources' magnitude, prevalence, potential threat to public health and proximity to receiving water; (2) results from microbial tracking studies conducted in the watershed and region; and (3) best professional judgment.

The wet weather load reduction quantification approach involves similar steps for each of the Public-Private Partnership Programs included in this WQIP. The first step was to identify the source addressed by the program (e.g. bacteria in rooftop runoff). The next step was to calculate the targeted pollutant source area that the BMP will address (e.g. acres of rooftop). Once the targeted pollutant source area was calculated, the unit effectiveness of the selected BMP was modeled in SBPAT for a standard design (e.g. reduction of bacteria load per acre as a result of the implementation of a rain barrel). The potential load reduction benefit was then calculated by multiplying the unit effectiveness of the selected BMP by the targeted pollutant source area addressed. The following sections provide a brief description of the specific quantification approach for each wet weather Public-Private Partnership Program, along with relevant assumptions and assumption explanations. Table C1 provides a summary of wet weather non-structural BMPs and a quantification of water quality benefits.

Table C1. Wet-weather Quantification of Water Quality Benefits (Not including City of San Diego)

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load ^{1,2} by 2031	
				Load Assumption	Units	Citation/Assumptions		Fecal Coliform (10 ^12 MPN and percent)	
								Low Range	High Range
Potential Public Private Partnership Program	Wet Weather	Single Family Residential (SFR)	Residential Roofs	54,474	Parcels of Single Family Residential in Watershed	SANDAG Land Use and Parcel Data	(residential parcels in watershed) * (SFR rooftop area) * [(expected percent of residential area converted to rain barrels) * (annual load reduction per acre conversion to rain barrels) + (expected percent of SFR disconnected to lawns) * (annual load reduction per acre from disconnection to lawn)]	75 1.6%	710 15%
				1500 - 4500	Single Family Residential Rooftop Size	Range developed on a GIS assessment of 20 parcels per jurisdiction			
				0.090	10 ^12 MPN of fecal coliform reduced per impervious acre treated by rain barrels	Modeled in SBPAT using Santee rainfall data, assumed 0.2 inch design storm (equates to one 55 gallon barrel for each 500 sq.-ft roof area), 10-day drain time.			
				0.429	10 ^12 MPN of fecal coliform reduced per impervious acre treated by disconnection	Modeled in SBPAT using Santee rainfall data, assumed area receiving flow would have an infiltration rate of 0.15 in/hr. (C/B soils) and effective depression storage (including root zone) of 0.7 inches, and would be 1/4 the area of contributing flow			
				2.5-10%	Percent of Residential Area Converted to rain barrels	Conversion over 15 years, based on expected effectiveness of incentives program.			
				7.5-30%	Percent of Residential Area Converted to disconnected to pervious area.	Conversion over 15 years, based on expected effectiveness of incentives program.			
Redevelopment through Permit-Required LID Implementation	Wet Weather	All Land Uses covered under SUSMP	Urban development	0.135	10^12 MPN of fecal coliform reduced per Residential Acre Converted	Modeled in SBPAT using Santee rainfall data; Applied standard SUSMP-sized bioretention with underdrains to unit areas of various land uses.	Sum for all land uses of (Load Reduction per Acre Converted) * (Acres Converted per Year) * (Years to 2031) * (+ or - 20%)	160 3.4%	240 5.2%
				0.394	10^12 MPN of fecal coliform reduced per Commercial Acre Converted				
				0.155	10^12 MPN of fecal coliform reduced per Industrial Acre Converted				
				0.006	10^12 MPN of fecal coliform reduced per Education Acre Converted				
				0.002	10^12 MPN of fecal coliform reduced per Transportation Acre Converted				
				995	Acres Residential Converted per year (Land Use Redev. Rate = 0.18%)	Calculated by Extrapolating City of LA Redevelopment Rate From Ballona IP (rate shown in parentheses) to watershed area by land use			
				78.2	Acres Commercial Converted per year (Land Use Redev. Rate = 0.15%)				
				161	Acres Industrial Converted per year (Land Use Redev. Rate = 0.34%)				
				50.2	Acres Education Converted per year (Land Use Redev. Rate = 0.16%)				
				1105	Acres Transportation Converted per year (Land Use Redev. Rate = 2.7%)				
Wet Weather Total							Total expected load reduction	235	950
							% of average MS4 total load	5.1%	20%

1. The MS4 baseline load for wet weather was calculated in SBPAT and the 25th and 75th Percentiles of the annual load was used to create these ranges.
2. Load reductions do not include benefits from nonstructural BMPs in the City of San Diego.

Private-Public Partnership Program

Two main low impact development BMPs quantified for the incentive program are: 1) a rain barrel program and 2) a downspout disconnect program. The average performance, during wet weather, of these programs per rooftop acre was modeled in SBPAT for WY (2003), consistent with the baseline load calculations (see Section 3.3.1.1 for discussion). The area of implementation was based on land use information and a preliminary assessment of single-family residential homes in the watershed. The extent of single-family residential homes that will be converted to rain barrels was estimated to be 2.5-10% and amount of homes that will disconnect their downspouts was estimated to be 7.5-30% of all SFR homes in the Watershed over a 16 year period, based on the expected effectiveness of the given incentives program. Additional load reduction benefit may be achieved by expanding the program to commercial areas as well.



Figure C1. Residential Rain Barrel and Downspout Disconnect Incentive Program

Benefits from the homes to be retrofitted with rain barrels were estimated by multiplying the area to receive rain barrels with the unit reduction that was modeled in SBPAT using Santee rainfall data, assuming a 0.2 inch design storm (equates to one 55 gallon barrel for each 500 sq.-ft. roof area) and a 10-day drain time.

Benefits from the homes to be treated by disconnecting downspouts were estimated by multiplying the area to receive disconnection with the unit reduction that was modeled in SBPAT using Santee rainfall data, assuming the area receiving flow would have an infiltration rate of 0.15 in/hr. (C/B soils) and effective depression storage (including root zone) of 0.7 inches, and would be 1/4 the area of contributing flow. This program can be implemented in other land uses such as commercial, for example.

Redevelopment through Permit-Required LID Implementation

This WQIP assumes that a portion of already developed areas in the watershed has been and will be redeveloped from when the TMDL was initiated to the end of the compliance period. This redevelopment is subject to the post-construction treatment requirements contained in the San Diego MS4 Permit (Provision E.3.b) and will therefore result in load reduction benefits. A Standard Urban Storm water Management Plan (SUSMP)-sized bioretention system with underdrains was modeled in SBPAT for residential, commercial, industrial, education, and transportation land uses during the TMDL Critical Water Year (2003) to give the bacteria load reductions per acre converted. The rate of redevelopment requiring SUMSP LID implementation for each of these land uses was extrapolated based on the rate analysis done for the Ballona Creek IP. During the 20 year compliance timeline this rate will result in redevelopment of approximately 6% of the MS4 area. For each land use, the load reductions per acre was multiplied by the land use specific redevelopment rate, the number of land use acres, and the number of years from when the TMDL was initiated to the end of the compliance period.

THE CITY OF SAN DIEGO

The purpose of this section is to summarize the extent to which each nonstructural BMP contributes to pollutant removal in the San Diego River watershed. The City of San Diego was able to quantify several types of BMPs that are effective at reducing bacteria loads. These BMPs and their overall load reduction are discussed below.

Street Sweeping

Enhanced street sweeping activities provide direct, additional load reduction for specific pollutants. Sediment and other debris that collect on roadways, medians, and gutters are removed from the watershed with each sweeping, along with the associated mass of other pollutants. However, results presented in Appendix A indicated that street sweeping does little in terms of bacteria load reductions. Since bacteria are the only TMDL pollutant for San Diego River, this BMP is not recommended for the San Diego River watershed.

Catch Basin Cleaning

Enhanced catch basin cleaning programs provide direct, additional load reduction for specific pollutants. Sediment and other debris trapped in catch basins are removed from the collection system with each cleaning, along with the associated mass of other pollutants. However, results presented in Appendix A indicated that catch basin cleaning does little in terms of bacteria load reductions. Since bacteria are the only TMDL pollutant for San Diego River, this BMP is not recommended for the San Diego watershed.

Rain Barrels Incentive Program

Rain barrels act as mechanisms to temporarily detain and re-route runoff from otherwise directly connected impervious areas to nearby pervious areas or other vegetated areas such as rain gardens, swales, and the like. Assumptions about the modeling process and the extent of implementation are presented in Appendix A. Due to the limited extent of implementation of this program, load reduction values are quite small.

Downspout Disconnection Incentive Program

Downspout disconnections provide a similar watershed impact as rain barrels and downspout disconnections are modeled similarly. Assumptions about the modeling process and the extent of implementation are also presented in Appendix A. Implementation of this program is substantially greater than the rain barrel program, although the total load reduction numbers remain small.

Irrigation Runoff Reduction

Irrigation runoff reduction was modeled as a turf conversion and irrigation efficiency program as documented in Appendix A. Turf conversion transforms area from grasses that require regular irrigation to other, native pervious cover which would not require regular irrigation. The irrigation efficiency program sets the goal of eliminating irrigation overspray practices over the course of the 20-year implementation period. It should be noted that the impact of the elimination of irrigation overspray on dry weather pollutant load reductions in the City of San Diego is heavily muted due to the way in which dry weather flows are tabulated for this analysis.

Summary of Modeled Nonstructural BMPs

Finally, all nonstructural BMPs were included in the baseline watershed model to determine the aggregate flow and pollutant load reduction. The combined estimates are presented in Table C2.

Table C2. San Diego River Watershed Bacteria Load Reduction for all Modeled Non-Structural Practices in the City of San Diego

Condition	Fecal Coliform (%)
Wet weather	0.37
Dry weather	45.65

B.3 CHAPTER APPENDIX D – WET WEATHER STRUCTURAL BMP DESCRIPTIONS AND LOAD REDUCTION QUANTIFICATIONS, METHODS, AND CALCULATIONS

Structural BMPs are engineered systems designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological update, media absorption, or any other physical, biological or chemical process. Two types of structural BMPs have been proposed for implementation and modeled for this WQIP: distributed and regional. Distributed structural BMPs are implemented at the neighborhood, parcel or site scale and can include green streets, rainwater harvesting and other low-impact development solutions. Regional structural BMPs are implemented to treat sub-watershed or catchment scale drainage areas and include structures such as subsurface flow wetlands, infiltration basins and constructed wetlands.

The quantification methods differed slightly between the City of San Diego and the Cities of El Cajon, La Mesa, and Santee and the County of San Diego. The methods and results are described separately in this appendix.

CITIES OF EL CAJON, LA MESA, AND SANTEE AND THE COUNTY OF SAN DIEGO - LOAD REDUCTION METHODS INFORMATION FOR ALL WET WEATHER STRUCTURAL BMPs

Load reductions for structural BMPs during wet weather were calculated using SBPAT as described in Appendix C. In general, design criteria for each selected BMP were first defined considering site constraints (in particular, acreage available for each BMP footprint), BMP performance data, and local regulations. For example, for regional BMPs, if there was not adequate space to provide full SUSMP-level treatment, estimated load reductions were based on available area (publicly owned) and benefits were calculated accordingly. Once a BMP was identified and design criteria defined for each feasible BMP opportunity site, SBPAT was used to evaluate the impact of implementing this suite of BMPs on water quality in the region. Details of the methodology and specific design criteria for regional versus distributed BMPs are discussed in the following sections.

Locations for distributed and regional BMPs were identified using the SBPAT catchment prioritization step, which orders catchments within the Watershed based on their potential to generate the highest pollutant loads during wet weather events. This allows identification of locations within the Watershed that offer the greatest potential benefits in terms of load reductions through implementation of BMPs. Consistent with the goal of prioritizing strategies with a multi-

pollutant benefit, this catchment prioritization analysis was conducted considering nitrogen and phosphorus (using total suspended solids as a proxy)⁴, in addition to the HPWQC.

IMPLEMENTED DISTRIBUTED STRUCTURAL BMPs

Baseline loads in the WQIP included loads from development that occurred between the TMDL year (2003) and 2009, since the WQIP baseline load was developed using 2009 land use data. As such, structural BMPs that were implemented between the TMDL year (2003) and 2009 as mitigation to this anticipated development were considered as part of the overall pollutant load reduction to be achieved by the WQIP. A map with their locations is shown in Figure D1.

No credit is given in the WQIP for BMPs to be implemented as mitigation to new development after 2009 as it is assumed that the loads mitigated by the BMPs will offset the additional loads generated by new development (i.e. no net decrease in pollutant load). Refer to Appendix C where the role of implemented structural BMPs in the WQIP's baseline load calculations is discussed.

Load Reduction Quantification Methods – Specific Design Criteria

- Distributed BMPs were modeled as bioretention and bioretention swales with under drains⁵ according to their infiltration capacity. Design criteria for quantifying the distributed parameters were developed using the following assumptions:
- Distributed BMPs within a catchment would be implemented to treat 25 percent of the MS4 area within a given catchment;
- Four (4) percent of the contributing area would be required for treating full SUSMP rainfall depth of 0.75 inches from the contributing area with distributed BMPs. This assumption was based on previous experiences with implementation of similar distributed BMPs;
- For catchments where sufficient land was not available, the design storm was taken to be a fraction of this 0.75 inch storm according to what percent of the contributing area was potentially available for BMP installation;
- Other design criteria for bioretention:
 - Design Volume: governed by available space and contributing area
 - Retention Depth: 12 inches
 - Infiltration Rate: governed by soil type.
- Other design criteria for bioretention swale with under drains:
 - Design Flow Rate: governed by available space and contributing area

⁴ The SBPAT catchment prioritization step does not include an option for phosphorus. Because of this, TSS was used as a proxy for phosphorus, since the majority of phosphorus is associated with solids. The load reduction analysis step in SBPAT does include phosphorus, so no proxy was necessary for this portion of the analysis.

⁵ Bioretention-type BMPs are landscaped shallow depressions that capture and filter storm water runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and, optionally, a subsurface gravel reservoir layer.

- Hydraulic Residence Time: 10 min
 - Longitudinal Slope: 0.03 ft./ft.
 - Manning's Roughness Coefficient: 0.25
- Water Quality Flow Depth: 4 inches
- Retention Depth: 2 inches
- Infiltration Rate: governed by soil type.

Distributed BMPs were grouped according to ranges in sizing criteria, and each group was modeled once using the mean sizing criteria for the group to limit the number of runs in SBPAT. Model results, including pollutant removal and costs, were summed to determine the overall impact of the distributed BMPs. These estimated load reductions are presented in Table D1.

Locations and Descriptions of Implemented Distributed BMPs

The locations of the implemented distributed BMPs are identified in Figure D1 and their descriptions are provided in Table D1.

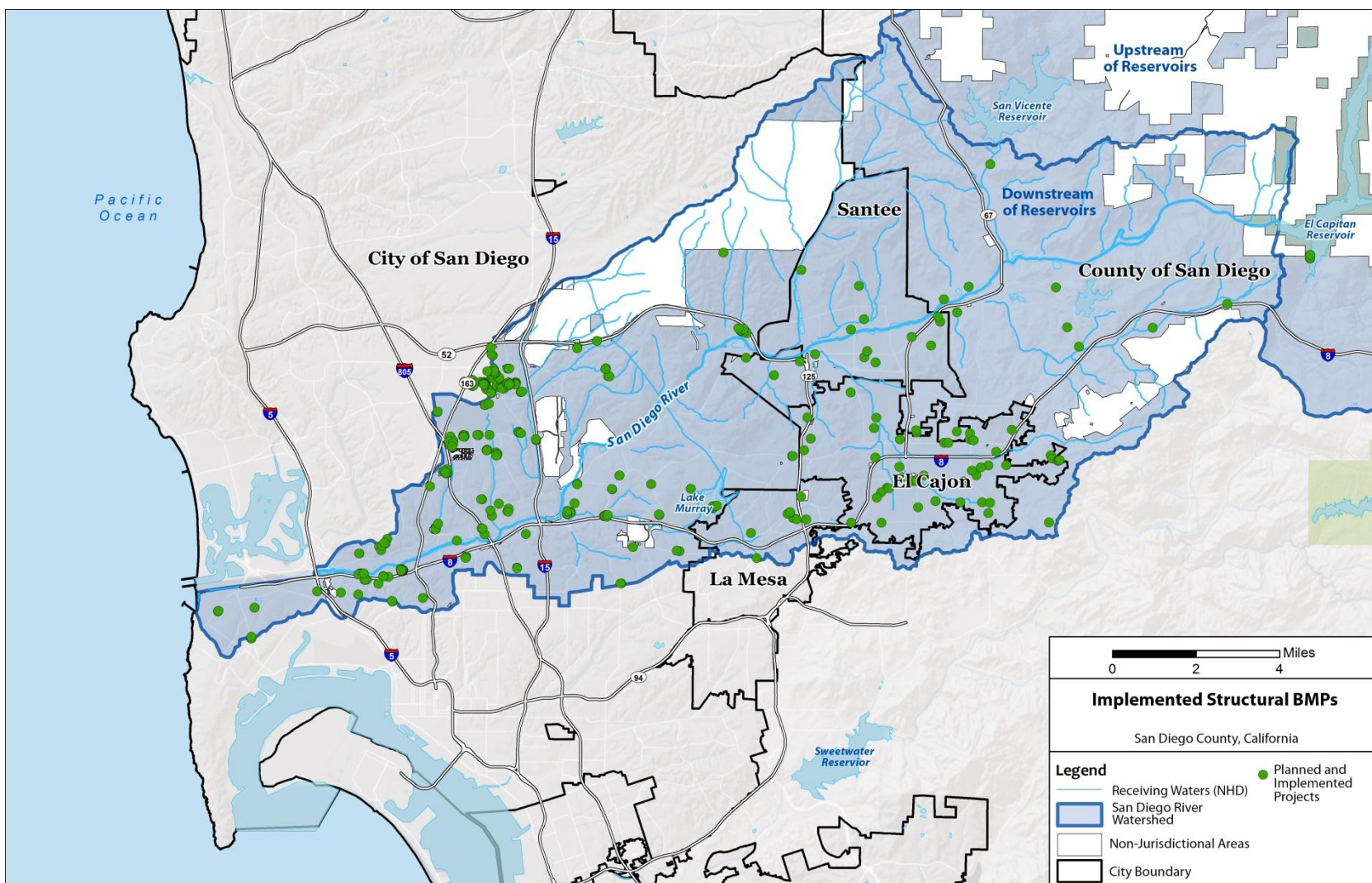


Figure D1. San Diego River Watershed Implemented Distributed Structural BMPs

Table D1. Descriptions of Implemented Distributed Structural BMPs

Jurisdiction	BMP Location	BMPs Implemented		Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
County of San Diego	9410 Adlai Terrace, Lakeside	Extended Basin	Detention	9.0	1078	SF Residential
County of San Diego	Canita Lomas and Liberatore Lane, El Cajon	Subsurface Infiltration		20.0	1460	SF Residential
County of San Diego	420 Hart Dr, El Cajon and PO Box 1507, Cardiff	Grass Swale		0.5	1476	MF Residential
County of San Diego	9108 Lake Valley Road, Lakeside	Vegetated Filter Strip		1.0	1067	Institutional/Education
County of San Diego	Laurel Canyon Rd a Vista Laurel Pl, Lakeside	Bioretention and Swale	Grass	5.5	1175	SF Residential
County of San Diego	9728 Marilla Drive, Lakeside	Bioretention Swale		4.4	1096	SF Residential
County of San Diego	1178 Persimmon Ave, El Cajon	Grass Swale		1.0	1474	MF Residential
County of San Diego	14878 Olde Highway 80, Lakeside	Permeable Porous Concrete	Paving,	2.0	1050	Institutional/Education
County of San Diego	15724 Olde Highway 80, El Cajon	Bioretention Swale		1.0	1041	Rural Residential
County of San Diego	10007 Riverford Road, Lakeside	Bioretention Swale		3.0	1188	Industrial
County of San Diego	11905 Riverside Drive, Lakeside	Wet pond		76.0	1187	MF Residential
County of San Diego	Woodside Avenue Extended Detention Basin	Detention basin		301	1185	MF Residential

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of El Cajon	1501 East Washington Ave, El Cajon	detention basin and filter inserts	0.6	4498	Commercial
City of El Cajon	327/359 El Cajon Blvd, El Cajon	detention basins and inlet filters	1.9	4496	Commercial
City of El Cajon	245 E. Main St. El Cajon	downspout filters	0.1	4501	Commercial
City of El Cajon	1062 N. Second St, El Cajon	grass filter strip	0.6	4513	Commercial
City of El Cajon	605 W. Lexington Ave, El Cajon	gravel filter, rock energy dissipater, and bio-detention basin	0.2	4496	Commercial
City of El Cajon	1401/1409 East Main St, El Cajon	hydrodynamic separation system, inlet filters, and underground detention box	4.0	4484	Commercial
City of El Cajon	442/444 El Cajon Blvd, El Cajon	pervious swale and media filter vaults	0.2	4495	Commercial
City of El Cajon	335/355 North Second St, El Cajon	vegetated swale and outlet filter	0.5	4483	Commercial
City of El Cajon	1190 N. Second St, El Cajon	grass filter strip	0.2	4513	SF Residential
City of El Cajon	1032 Broadway, El Cajon	inlet filter and grass buffer strip	0.3	4502	Commercial
City of El Cajon	343 E Main St, El Cajon	vegetated swales and filter inserts	0.3	4501	Commercial

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of El Cajon	938 E. Washington Ave, El Cajon	pervious swale	0.4	4501	Commercial
City of El Cajon	1301 N. Marshall Ave, El Cajon	gravel infiltration basin	0.4	4510	Commercial
City of El Cajon	608 Sandra Lane, El Cajon	grass-lined channel	0.4	4489	SF Residential
City of El Cajon	1090 Broadway, El Cajon	grass filter strip and inlet filter inserts	0.4	4513	Commercial
City of El Cajon	613 Sandra Lane, El Cajon	detention basin	0.5	4489	SF Residential
City of El Cajon	403/431 Wisconsin Lane, El Cajon	sand media filter, underground detention basin, and inlet filter	0.5	4487	SF Residential
City of El Cajon	1470 E. Madison Ave, El Cajon	Pervious concrete swale	0.6	4484	Commercial
City of El Cajon	475/487 Foundation Lane, El Cajon	vegetated swale and inlet filter	0.6	4482	SF Residential
City of El Cajon	635 Sandra Lane , El Cajon	Detention basin	0.6	4489	SF Residential
City of El Cajon	1700 E. Main St, El Cajon	Vegetated swales, inlet filter, and infiltration basin	0.6	4507	Commercial
City of El Cajon	1108/1116 Anita Lee Lane, El Cajon	Grassy swales and curb outlet filters	0.6	4494	SF Residential
City of El Cajon	670 El Cajon Blvd, El Cajon	Underground detention pipe and hydrodynamic separator	0.7	4495	MF Residential

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of El Cajon	1273/1275 E. Main St, El Cajon	Vegetated swale and porous pavement,	0.7	4483	Commercial
City of El Cajon	912/930 Jamacha Rd, El Cajon	Infiltration system, vegetated swale, and storm drain inlet filters	0.8	4497	MF Residential
City of El Cajon	1341 E Main St, El Cajon	vegetated swales, gravel infiltration areas, and inlet filter inserts	0.8	4483	Commercial
City of El Cajon	1380 El Cajon Blvd, El Cajon	underground detention system	0.9	4493	Commercial
City of El Cajon	1326/1350 Wendell Cutting Ct, El Cajon	vegetated swales, underground detention, and inlet filter	1.0	4508	SF Residential
City of El Cajon	2095 East Madison Ave, El Cajon	biofilters and detention basin	1.0	4489	Commercial
City of El Cajon	1539 E. Main Street, El Cajon	underground detention pipe, pervious swale, and inlet filters	1.1	4508	MF Residential
City of El Cajon	2000/2010 Gillespie Way, El Cajon	detention area in parking lot, vegetated swale, and filter inserts	1.7	4504	Industrial
City of El Cajon	1225/1285 East Washington Ave, El Cajon	Biofilters for each new housing unit (perimeter)	1.8	4479	SF Residential

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of El Cajon	2766 Navajo Rd., El Cajon	Hydrodynamic separation system and underground detention box	2.5	4240	Institutional/Education
City of El Cajon	Grossmont College Drive, El Cajon	hydrodynamic separation system and detention area	2.7	4244	Institutional/Education
City of El Cajon	1630/1632 E Madison Ave, El Cajon	vegetated detention basin and inlet filters	4.1	4484	Institutional/Education
City of El Cajon	198 W Main St, El Cajon	vegetated swales, hydrodynamic separator system, trash enclosure dry wells, and trench drain, downspout, inlet filters	4.7	4496	Commercial
City of El Cajon	1001 W. Bradley Ave, El Cajon	pervious swales, inlet filter, and detention basin	4.8	4510	Industrial
City of El Cajon	2062/2096 Ingamac Way Ave, El Cajon	extended detention basin and grassy swales	4.9	4489	SF Residential
City of El Cajon	1435 E. Washington Ave, El Cajon	vegetated swale, two extended detention basin, and storm drain inlet filters	6.1	4498	SF Residential

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of El Cajon	Anjuli Ct, El Cajon	Hydrodynamics separator system	6.4	4241	SF Residential
City of El Cajon	965 Arnele Ave, El Cajon	vegetated bioswales, pervious buffer strip, and bioretention swale.	6.9	4511	Commercial
City of El Cajon	298 Fletcher Pkwy, El Cajon	inlet filters, CDS hydrodynamic separator units, and filtration strip next to Garden Center	8.3	4502	Commercial
City of El Cajon	1935/1941 Granite Hills Dr., El Cajon	detention basin and vegetated channel	9.1	4484	SF Residential
City of El Cajon	189 Roanoke Rd, El Cajon	vegetated swales and storm drain inlet filters	10.7	4500	Institutional/Education
City of La Mesa	8085 University Avenue, La Mesa	Vegetated Swale, Vortex Separator	1.0	5294	Commercial
City of La Mesa	8010 Parkway Dr., La Mesa	Media Filter	10.5	5291	Commercial
City of La Mesa	8860/8870 Center Dr., La Mesa	Media Filter, Bioswale	3.2	5288	MF Residential
City of La Mesa	8727/8655 Fletcher Parkway, La Mesa	Media Filter, Drainage inserts	7.0	5287	SF Residential
City of La Mesa	9001 Wakarusa St., La Mesa	Wetland/Detention Area	3.6	5454	Institutional/Education
City of La Mesa	8881 Dallas St., La Mesa	Bioswale, Media Filter	2.7	5285	Institutional/Education

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of La Mesa	5555 Grossmont center Dr., La Mesa	Media Filter	15.0	5288	Commercial
City of La Mesa	8725 Fletcher Parkway, La Mesa	Media Filter	0.5	5287	Transportation
City of Santee	Aubrey Glen, Hiser Road and Mission Gorge Road	Hydrodynamic Separator System	8.0	3247	MF Residential
City of Santee	Autowerks, APN: 383-112-53	Drainage inserts and grass swales	2.5	3251	Commercial
City of Santee	Autumn wood II, APN: 381-681-20	Hydrodynamic Separator System	10.0	3237	MF Residential
City of Santee	Boys and Girls Club, 8820 Tamberley Way	Grassy swale, drainage inserts.	1.0	3802	Institutional/Education
City of Santee	Cabins at Lake 7, APN: 378 020 49, 376 010 07	Wet pond	20.0	3200	Institutional/Education
City of Santee	Chapparel (Mission View Estates), West of Mesa Road	Bioswales and media filter	2.0	3250	MF Residential
City of Santee	Ciraolo Industrial Building, APN: 381-540-10 and 11	Inlet filters, grass swale, downspout filters	2.0	3262	Industrial
City of Santee	Hartford Insurance, APN: 381-050-59	Vegetated swale, rocky swale, and drainage inserts	6.0	3258	Commercial
City of Santee	Morningside, APN: 384-081-16	Hydrodynamic Separator System	6.0	3258	MF Residential

Jurisdiction	BMP Location	BMPs Implemented	Assumed Drainage Area (acres)	Catchment ID	Baseline Land Use (2009)
City of Santee	Rayo Wholesale, Rayo II, 11495 Woodside Avenue	Grass swale, Grassy detention basin with sand cone filter	3.0	3264	Industrial
City of Santee	Town Center Community Park, APN: 381-050-51, 52, and 381-051-06, 07	Media Filter, bioswales, buffer strips, inlet filters	12	3207	Institutional/Education
City of Santee	Toyota, APN: 383-124-11	Extended detention basin, bioretention, inlet filters	3.0	3255	Commercial
Caltrans	SR 52 Unit 5A	Bioswales	9.8		Transportation
Caltrans	SR 52 Unit 5A	Detention Basin	9.3		Transportation
Caltrans	SR 52 : 52/15 Separation To Mast Boulevard	Bioswales	4		Transportation
Caltrans	SR 52: Cuyamaca Street To Magnolia Avenue	Bioswales	21.5		Transportation
Caltrans	SR 52: Cuyamaca Street To Magnolia Avenue	Detention Basin	9.2		Transportation

Load Reduction Quantifications

The estimated load reductions for the modeled implemented distributed BMPs are presented in Table D2.

Table D2. Estimated Load Reductions from Distributed BMPs

Distributed BMPs	Water Quality (FC Load) Benefits (10 ¹² MPN reduction/year) [Low – High] ^a
Implemented Distributed Projects	53 [29 – 62]
Potential Distributed Projects	397 [214 – 463]

^a Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

STREAM ENHANCEMENT/RESTORATION PROJECTS

Stream enhancement/restoration projects, implemented from 2003 and through future proposed projects, were incorporated into the CLRP's load reduction estimates. The intent is not to design these projects to be inundated with untreated water, but to acknowledge the benefits these sites achieve when stormwater comes in contact with these sites. Wet weather benefits for these projects are estimated based on analysis of the project features. However, future flow and bacteria monitoring data should be used to confirm or revise these assumed benefits. The following potential net pollutant load reduction mechanisms were quantified for stream restoration projects:

- Increased volume reductions
- Increased hydraulic residence time
- Increased settleable solids
- Increase in decay coefficient to account for plant assimilative capacity.

Based on project features for each project, a low and high range of benefits are estimated using the two alternatives discussed below. The low and high values from the 4 estimates are used to estimate the load reductions for the project:

- For alternatives, the design flow rate and design volume of both the restored channel and the pre-project channel are assumed considering general water quality design guidelines and typical sediment resuspension velocities.
- For the first alternative, SBPAT BMP performance algorithms- which are based on hydrologic capture calculations conducted using SWMM- and effluent water quality data are used to estimate benefits:
 - A wetlands algorithm is used to estimate benefits associated with enhanced and/or created vegetation;
 - An infiltration algorithm is used to estimate benefits associated with volume reductions.
- For the second alternative, the change in volume reductions, first order decay coefficients, and load reductions associated with settleable solids are estimated based on system design features and a focused literature review.

- For the purpose of quantifying load reductions, it is assumed that restoration projects address dry weather and small storm flows predominantly. If the project is located on a floodplain bench and is only inundated in larger storm events, then benefits should not be claimed for the purpose of summing effective load reductions for comparison to the TLR.

Figure D2 shows locations and Table D3 presents a summary of the WY 2003 FC benefits for stream restoration projects.

Table D3. Estimated Load Reductions from Stream Enhancement/Restoration Projects

Location/Name	Water Quality (FIB-FC Load) Benefits (10 ¹² MPN reduction/year) ^a
Forester Creek	55 [13 - 96]
Woodglen Vista Creek	4 [1 - 6]
Las Colinas Channel	2 [0 - 3]
Alvarado Channel Restoration	6 [2 - 11]
Totals	67 [16 - 117]

^a Load reductions are for the Cities of Santee and La Mesa.

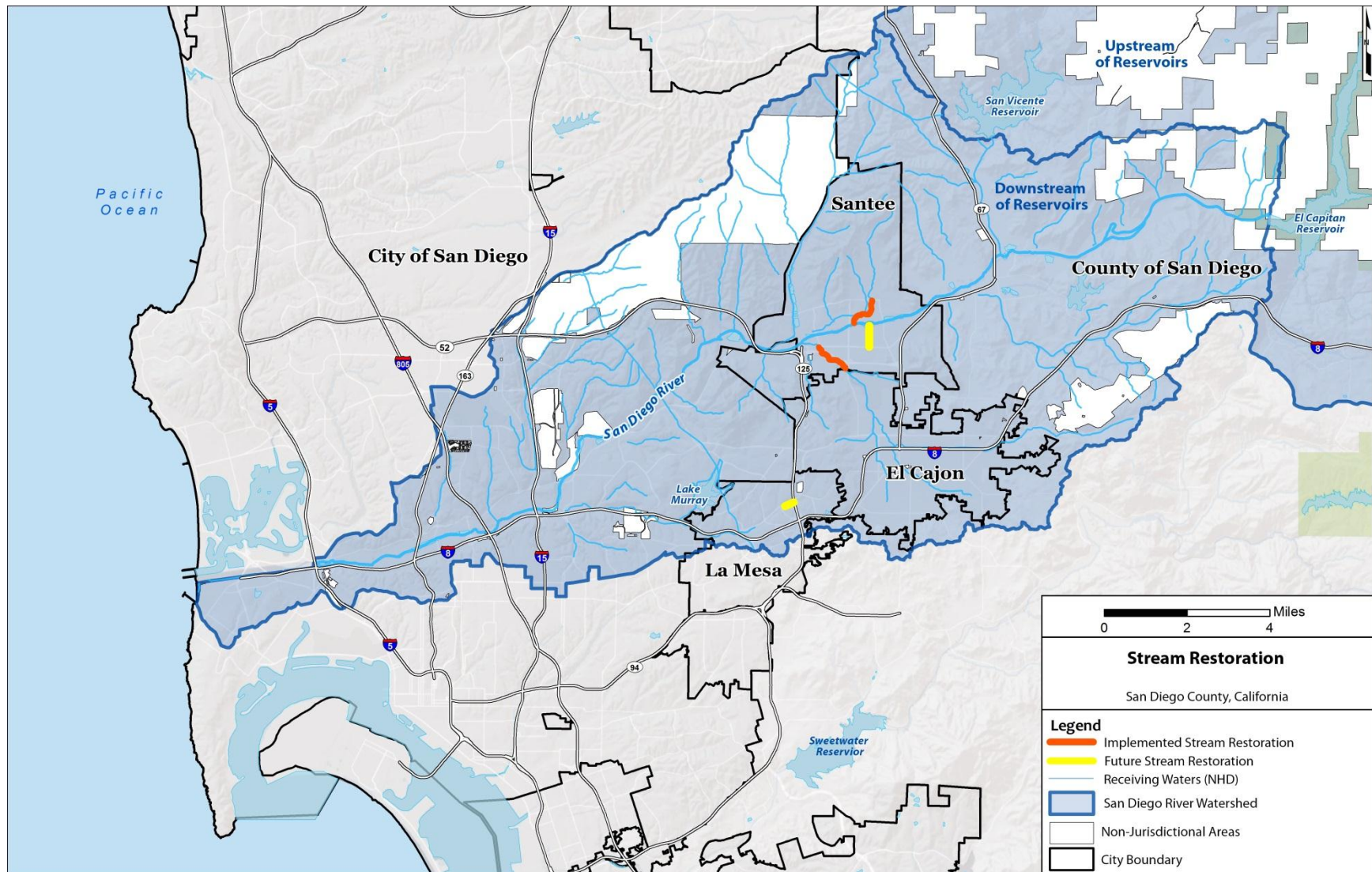


Figure D2. Stream Restoration Projects for San Diego River Watershed.

PROPOSED (OPTIONAL) DISTRIBUTED STRUCTURAL BMPs

The methods for quantifying load reductions for the proposed (optional) distributed structural BMPs are the same as those described for the implemented distributed BMPs above.

Catchment Prioritization Methods

Specific catchments within the watershed were identified as preferred locations for distributed structural BMPs. The San Diego River Watershed, downstream of the San Vicente and El Capitan reservoirs, was divided into 531 subcatchments. Using SBPAT, a catchment prioritization index (CPI) score was calculated for each catchment in the San Diego River Watershed. This score is based on the potential for each catchment to contribute pollutant loads, and can therefore be used to focus BMP efforts. The end result is a map of the entire watershed, highlighting the locations where BMPs can be installed with the greatest likelihood to improve water quality or reduce bacteria discharges.

Each catchment was given a normalized, unit-less CPI score between 1 and 5, with 5 representing the highest priority. For a more detailed explanation of the CPI calculation, see Step 1 of the SBPAT User's Guide (Geosyntec 2008). The following is a brief summary of the key elements of this step:

- Pollutant-specific CPI scores were calculated for each land use within a catchment as the product of land use specific pollutant EMCs, 85th-percentile precipitation, and runoff coefficients. These scores were then weighted by the area of each land use category within the catchment. Data used for each land use type is included in Appendix C.
- Individual pollutant CPI scores for each catchment were combined into an integrated CPI score.
- CPI scores were then further refined based on whether a catchment drained to an impaired water body, or a water body with an assigned TMDL. Weights of two and three, respectively, were assigned for catchments draining to impaired water bodies and water bodies with assigned TMDLs.

Results of the CPI analysis for the HPWQC and a combination of the HPWQC and nutrients are shown in Figure D3 and Figure D4.

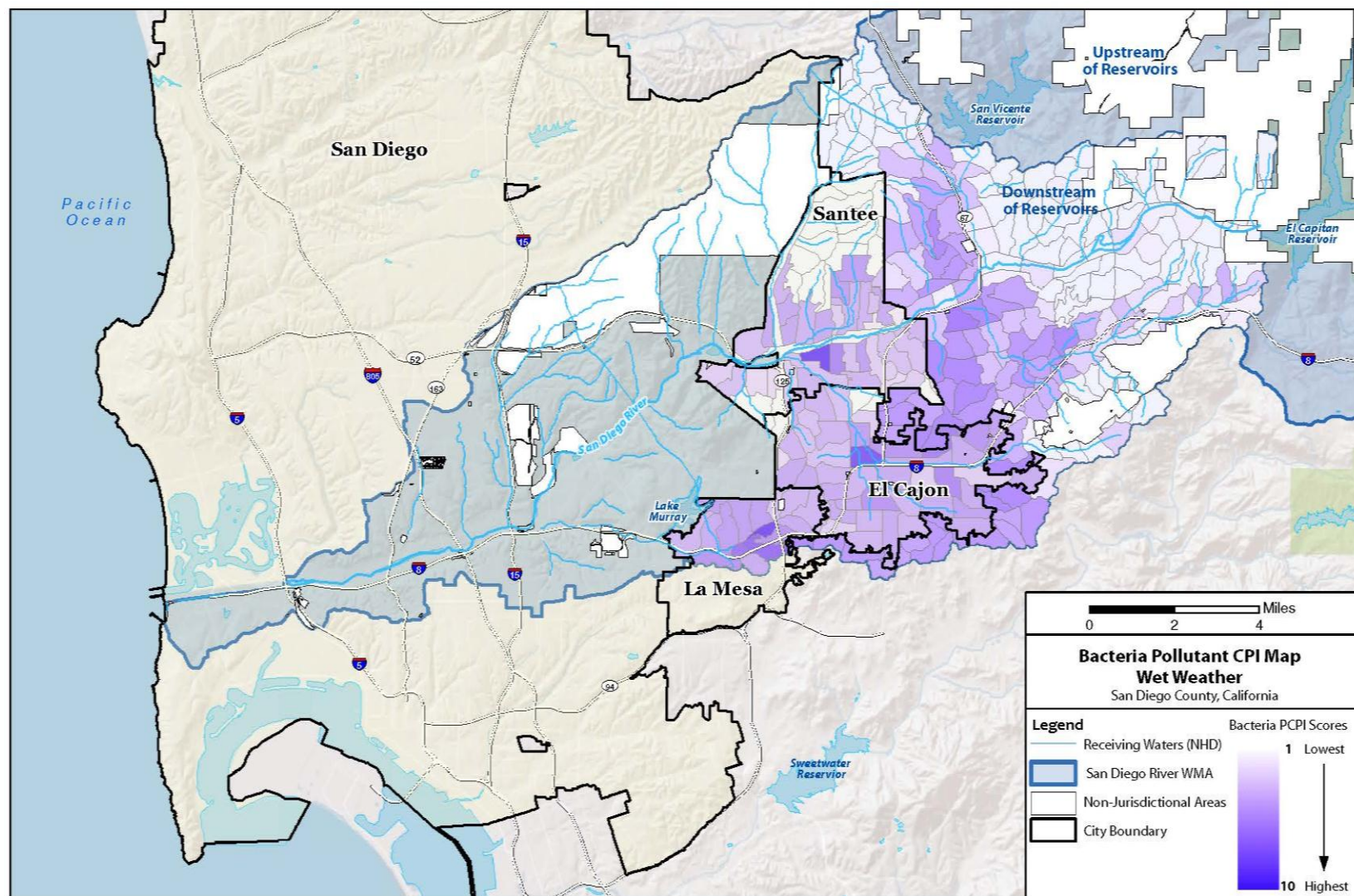


Figure D3. CPI Map for HPWQC

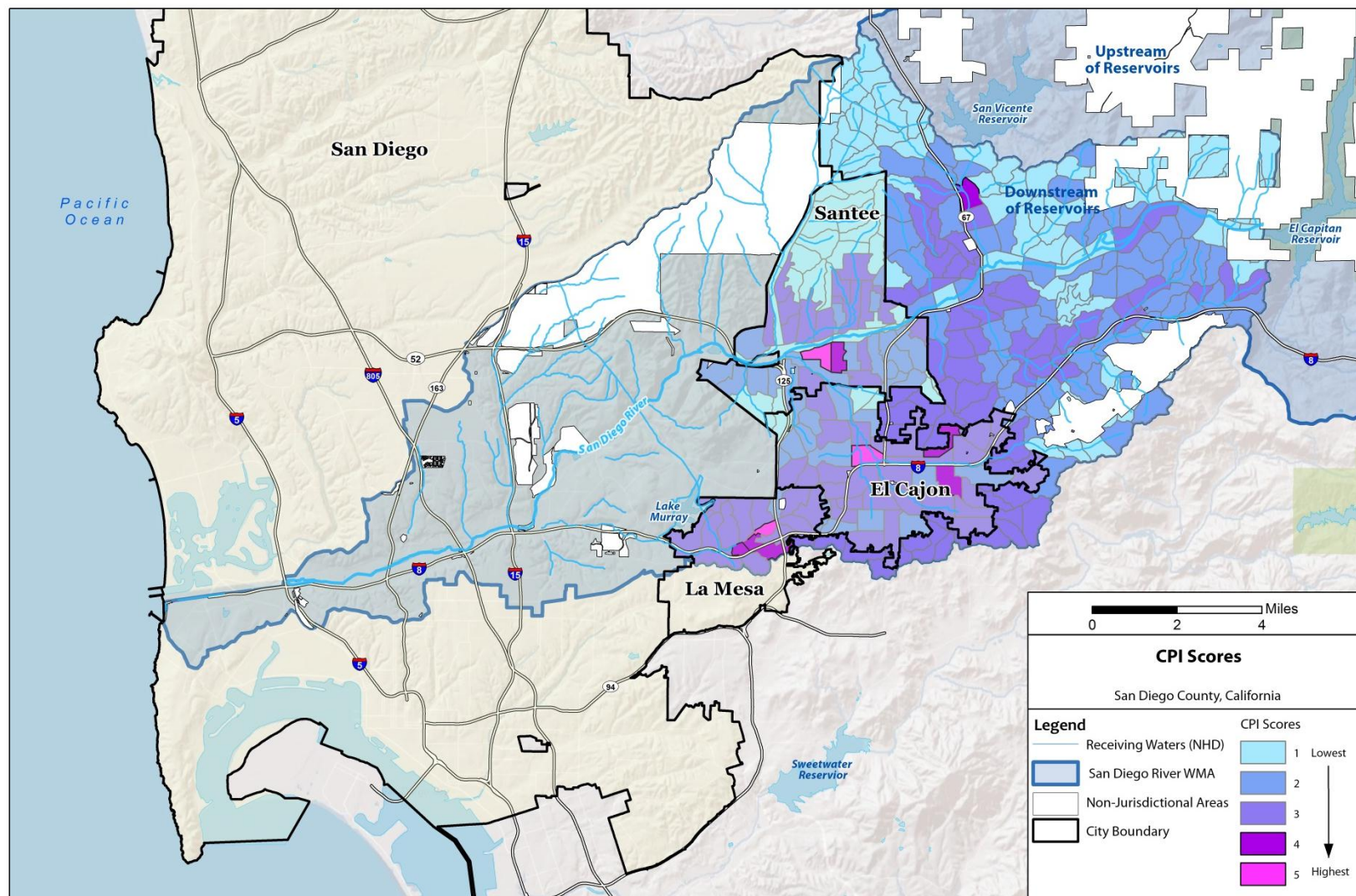


Figure D4. Integrated CPI Map for HPWQC and Nutrients

Catchments were selected as potential locations for future distributed BMPs if they had a CPI score of 3 or higher and had greater than 50 percent of Participating Agency area with the catchment. These catchments were then screened for potential distributed BMP opportunities, based on the presence of non-travelled public rights of ways (ROWs) within the high priority catchments. Based on random sampling of ROWs within the high priority catchments, and using best professional judgment, 40 percent of each sampled individual ROW was identified to be non-travelled and 10 percent of the non-travelled ROW area was assumed, on average, to be suitable for a BMP retrofit. Given the above two findings, four percent of the ROW area within high priority catchments was assumed to be suitable for a distributed BMP retrofit.

Distributed BMP types for retrofits within high priority catchments were selected based on the feasibility of infiltration (i.e., green BMPs) within the retrofit area. Retrofit area is considered feasible for infiltration if more than 50 percent of the retrofit area is categorized as NRCS A, B, or C type soils. The following guidelines were used for identifying candidate distributed BMPs:

- *Infiltration feasible*: Assumed that 50 percent of the drainage area would be treated with infiltration BMPs and the remaining 50 percent would be treated with a non-infiltration BMP.
- *Infiltration infeasible*: Treated with non-infiltration BMPs.

This WQIP assumes that bioretention type BMPs will be implemented for infiltration feasible sites and bioretention swales with underdrain type BMPs will be implemented for infiltration infeasible sites. While designing and implementing site specific distributed BMPs as part of the implementation plan, different BMPs may be selected provided the pollutant reductions achieved through the implemented projects will be equal to or greater than those modeled in this report. A map showing proposed catchments for distributed structural BMPs is shown in Figure D5 and load reduction are summarized in Table D4.

Table D4. Water Quality Benefits from Proposed Distributed Structural BMPs

BMP Type	FIB-FC load reduction % of Average Municipal Land Use Load)
	Average [Low-High]
Potential Public Private Partnership Program	8.5% [1.6% - 15%]
Redevelopment through Permit-Required LID Implementation	4.3% [3.4% - 5.1%]
Implemented Projects	1.1% [0.6% - 1.3%]
Future Projects	8.6% [4.6% - 10%]

^a Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

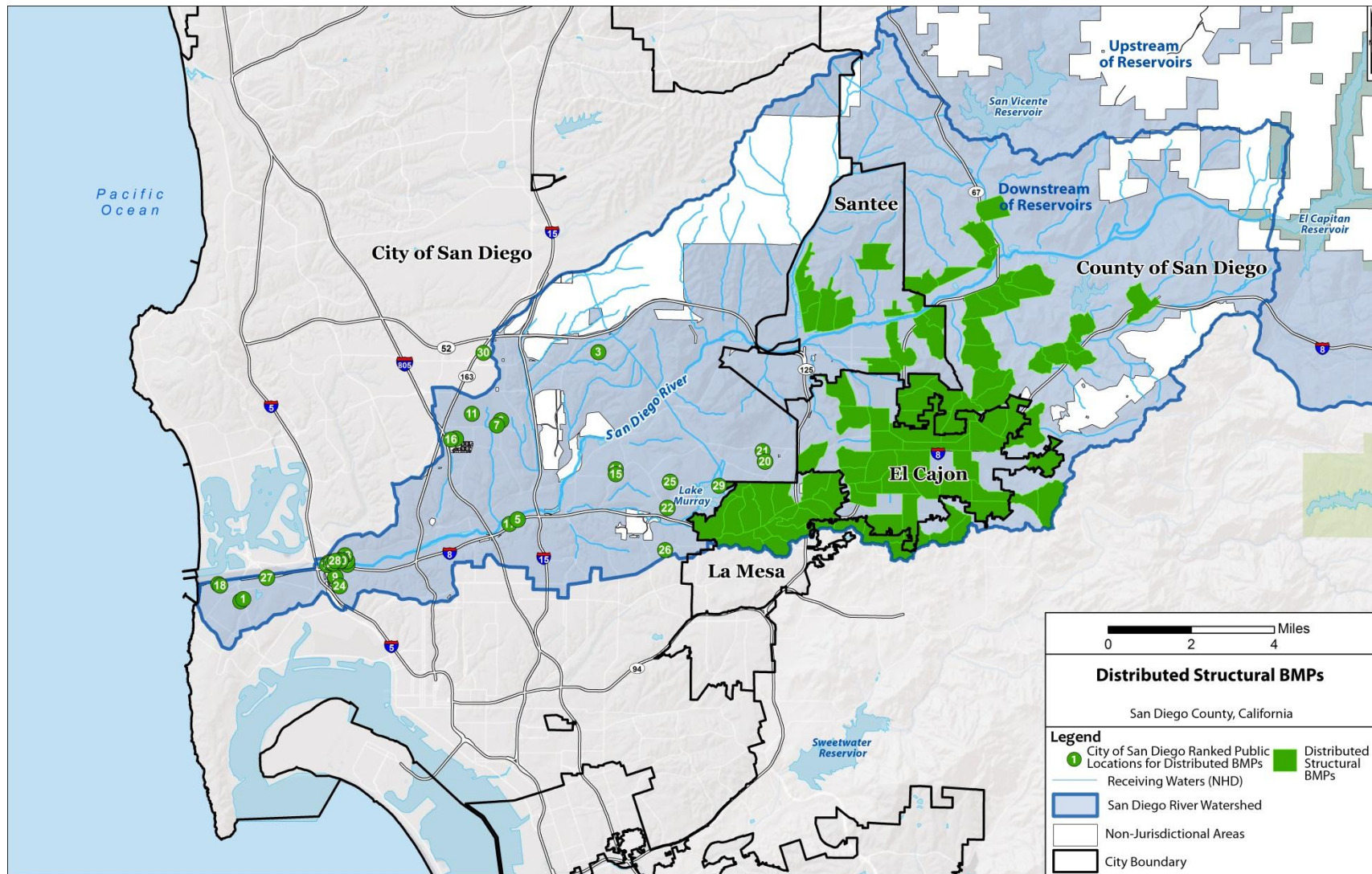


Figure D5. Proposed Catchments for Implementation of (Optional) Distributed Structural BMPs

PROPOSED REGIONAL STRUCTURAL BMPs

BMP design criteria for each specific project were developed using the following generalized design criteria:

Infiltration Basin Design Criteria:

- Drawdown time: 48 hours
- Infiltration rate: Per San Diego County treatment BMP design guidelines (County 2011), typical soil infiltration rates based on the NRCS soil texture were used with a factor of safety of two (2)
- Design volume: determined by space available for the BMP
- Depth: governed by the drawdown time and infiltration rate.

Subsurface Flow (SSF) Wetland Design Criteria:

- Hydraulic residence time: 24 hours
- Depth of wetland: 3-4 feet
- Porosity: 0.35-0.4
- Target equalization basin drawdown time: 48 hours
- Design volume: governed by the design depth and space available
- Treatment flow rate: governed by volume and hydraulic residence time.

Wetland/Wet Pond Design Criteria:

- Permanent pool hydraulic residence time: 24 hours
- Permanent pool depth: 4-5 feet
- Permanent pool volume: governed by space available and depth.

Design criteria specific to each project is presented in their respective BMP sheets, which are included below.

Once design criteria were established, SBPAT was used to determine the pollutant reduction that could be achieved through the implementation of these BMPs. This modeling analysis includes continuous hydrologic simulation of runoff quantities and BMP volume capture, as well as stochastic Monte Carlo calculation of pollutant load reduction based on BMP effluent concentrations. See the SBPAT Guidance Manual for further information (Geosyntec 2008).

Catchment Prioritization Methods

A “nodal” catchment prioritization index, or NCPI, is an area-weighted CPI that is based on upstream catchment CPI scores. In other words, use of NCPI allows identification of catchments that are downstream of multiple, hydrologically linked high-priority catchments that may be utilized for potential regional BMP implementation. Using the downstream catchment attribute, an NCPI score for each catchment was computed using an area-weighted average of the CPI scores for tributary catchments. Results of the NCPI analysis are shown in Figure D6.

After the catchments were prioritized, Geosyntec performed a desktop level screening of available public parcels in areas that would receive flows with higher estimated pollutant loading. Jurisdictions also provided parcels for screening. The desktop level screening took into consideration soil types, distance to receiving water, MS4 location, elevation, and surrounding land uses.

Site specific regional BMPs for the screened parcels were selected considering the following criteria:

- *BMP Performance*: Which BMP type is most effective at reducing concentrations of bacteria, nitrogen (nitrate), and phosphorous at this parcel?
- *Site-specific Constraints*: Which BMP type is feasible on the parcel given the location, parcel ownership, and physical characteristics of the site?
- *Costs*: Which BMP type is most cost-effective, both in capital expenditures and expected annual operations and maintenance costs?

The BMPs selected for pollutant removal modeling and cost estimation included subsurface flow wetlands, wetland/wet ponds, and infiltration basins, since these are the only structural BMP technologies capable of removing significant loads of FIB, nitrogen (nitrate), and phosphorous. Figure D7 shows a map of locations for the candidate regional structural BMPs.

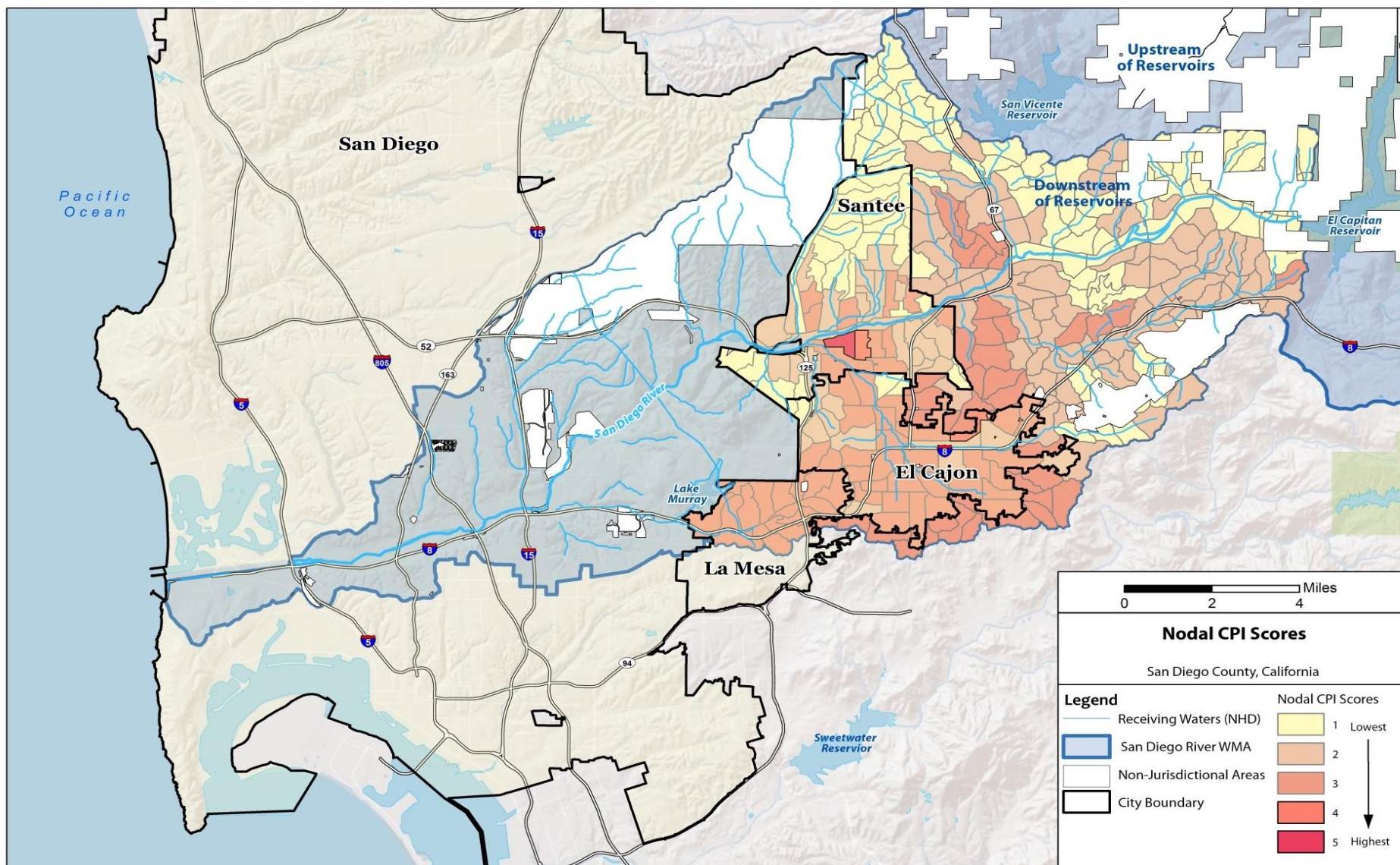


Figure D6. Integrated NCPI Map for Bacteria and Nutrients

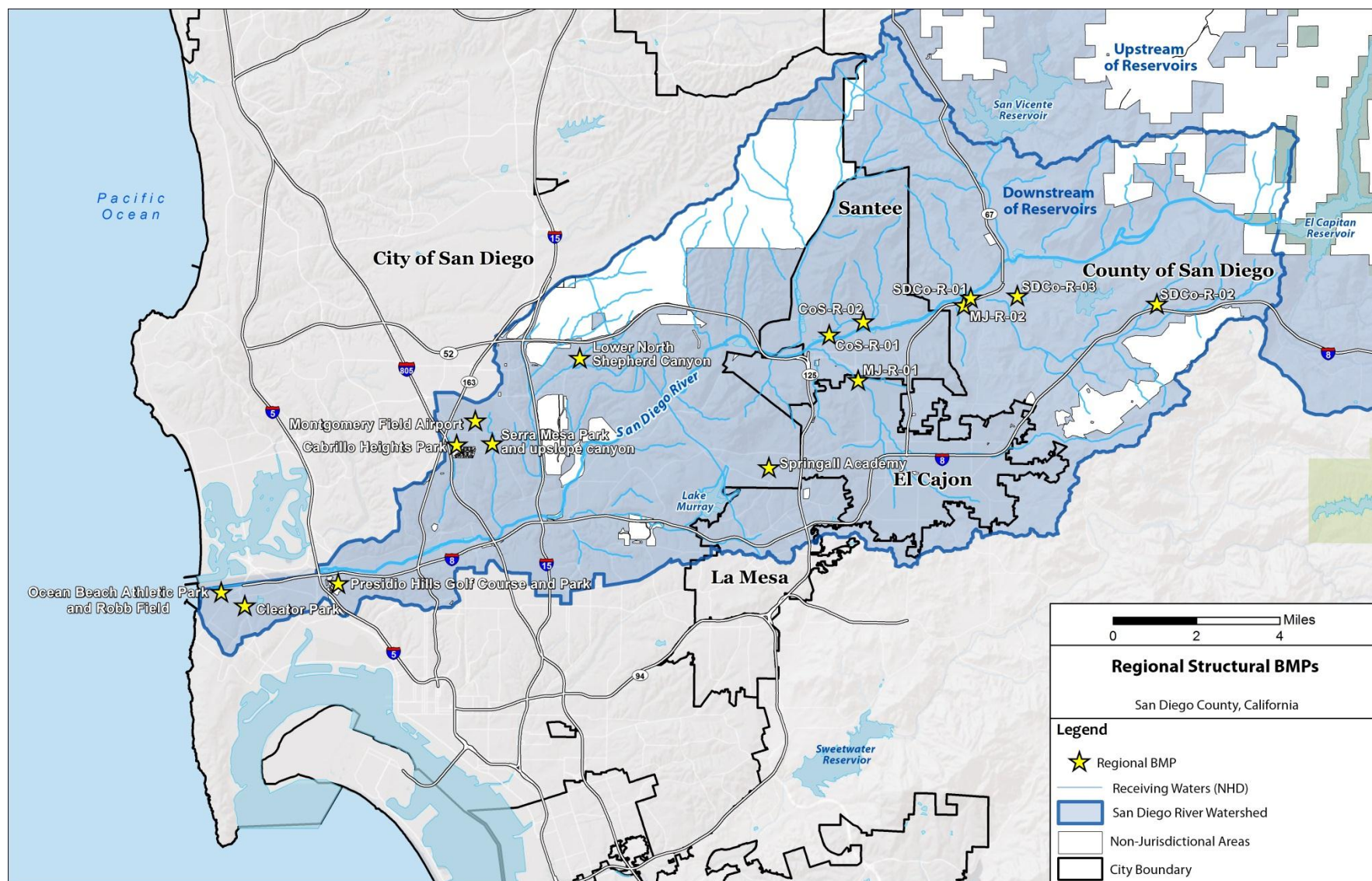


Figure D7. Locations of Proposed Regional Structural BMPs

The proposed regional BMPs are listed in Table D5, and design criteria specific to each project is presented in their respective BMP sheets, included as Figures D8 - D14.

Table D5. List of Proposed Regional BMPs

Figure #	Name	BMP Type
D8	CoS-R-01	SSF Wetlands
D9	CoS-R-02	SSF Wetlands
D10	MJ-R-01	Gross Solids and Trash Removal
D11	MJ-R-02	Infiltration Basin
D12	SDCo-R-01	66% Wetpond and 33% SSF Wetland
D13	SDCo-R-02	Subsurface Infiltration
D14	SDCo-R-03	Constructed Wetland

Figure D8.

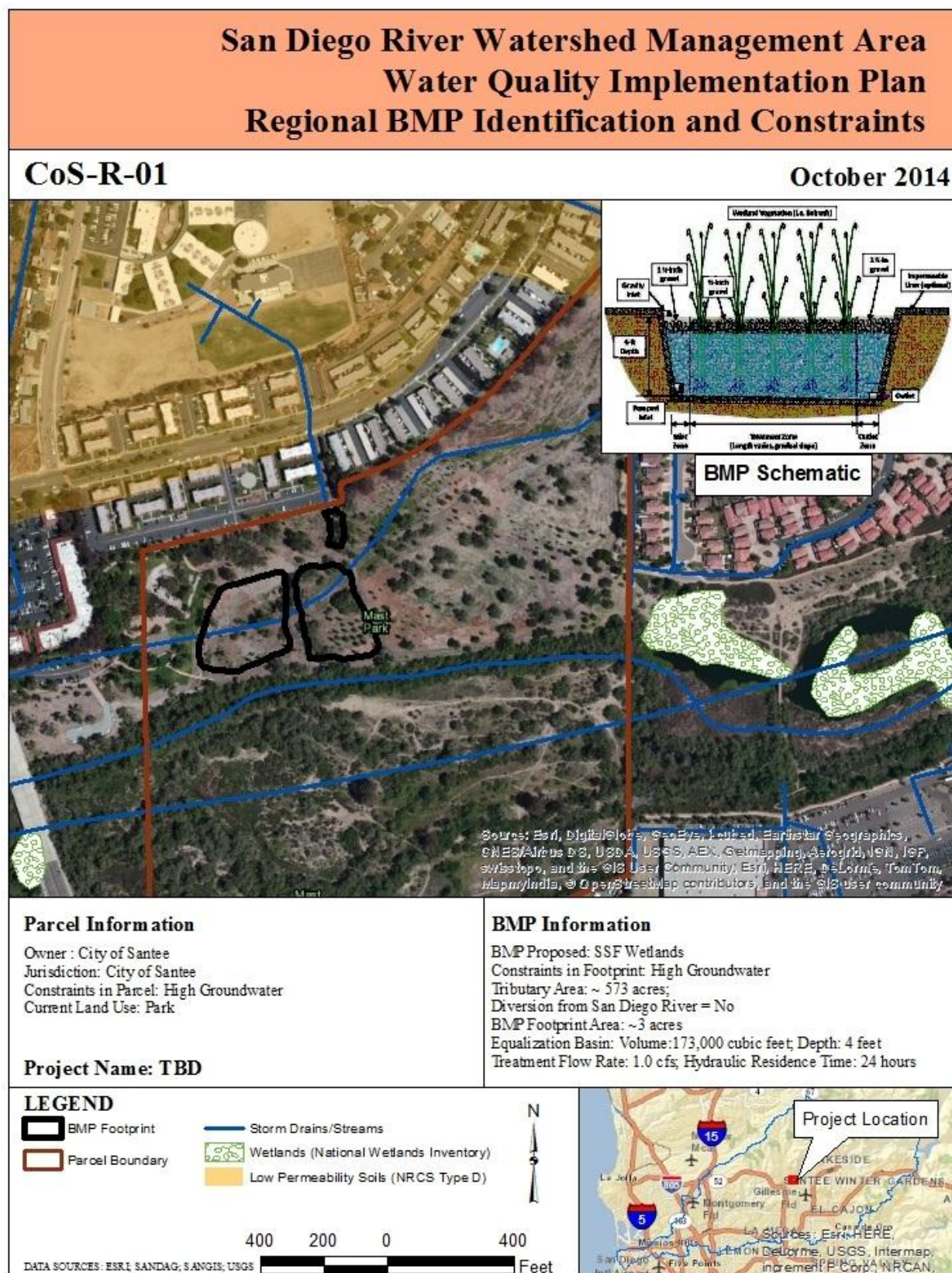


Figure D9.

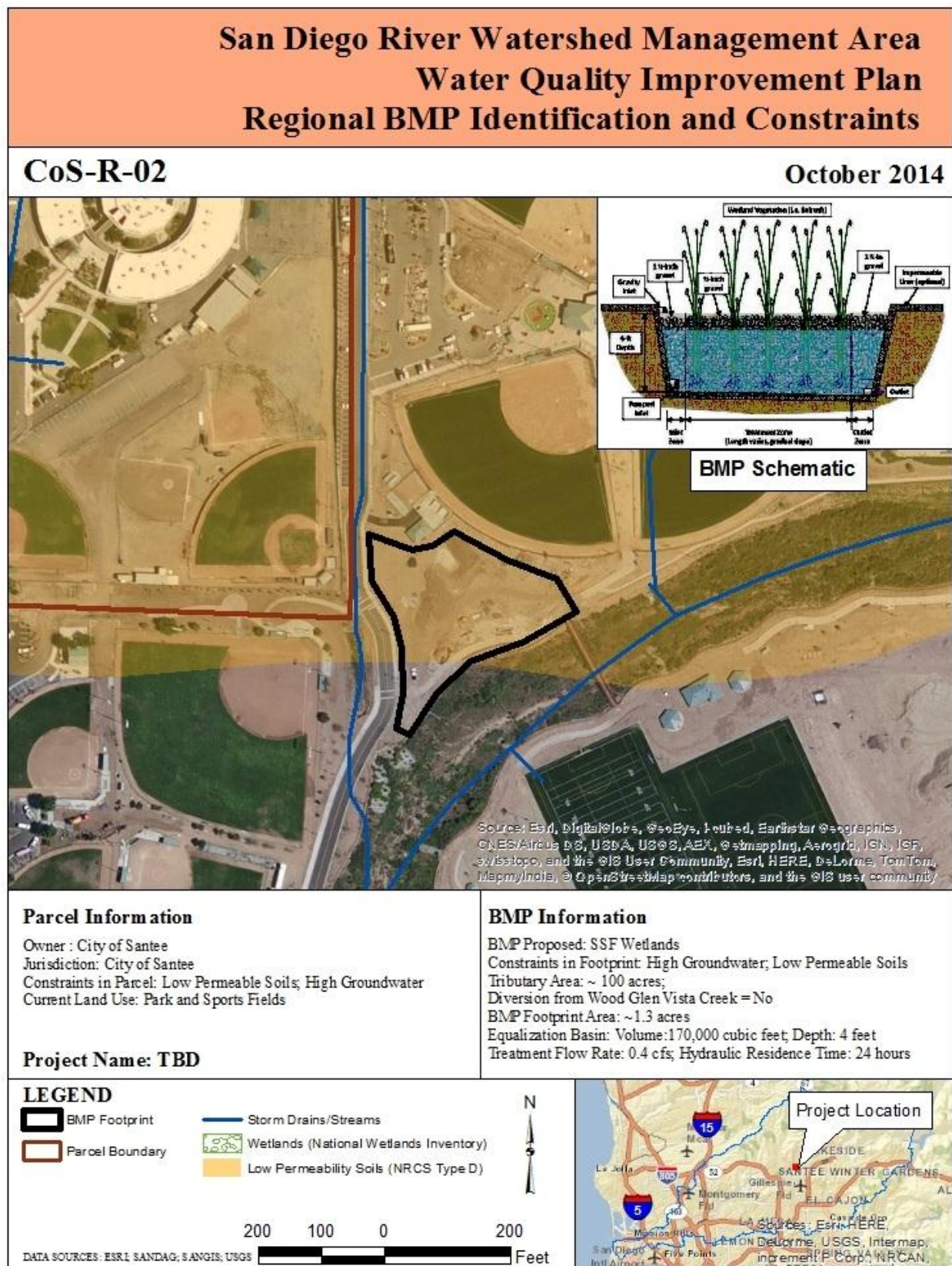


Figure D10.

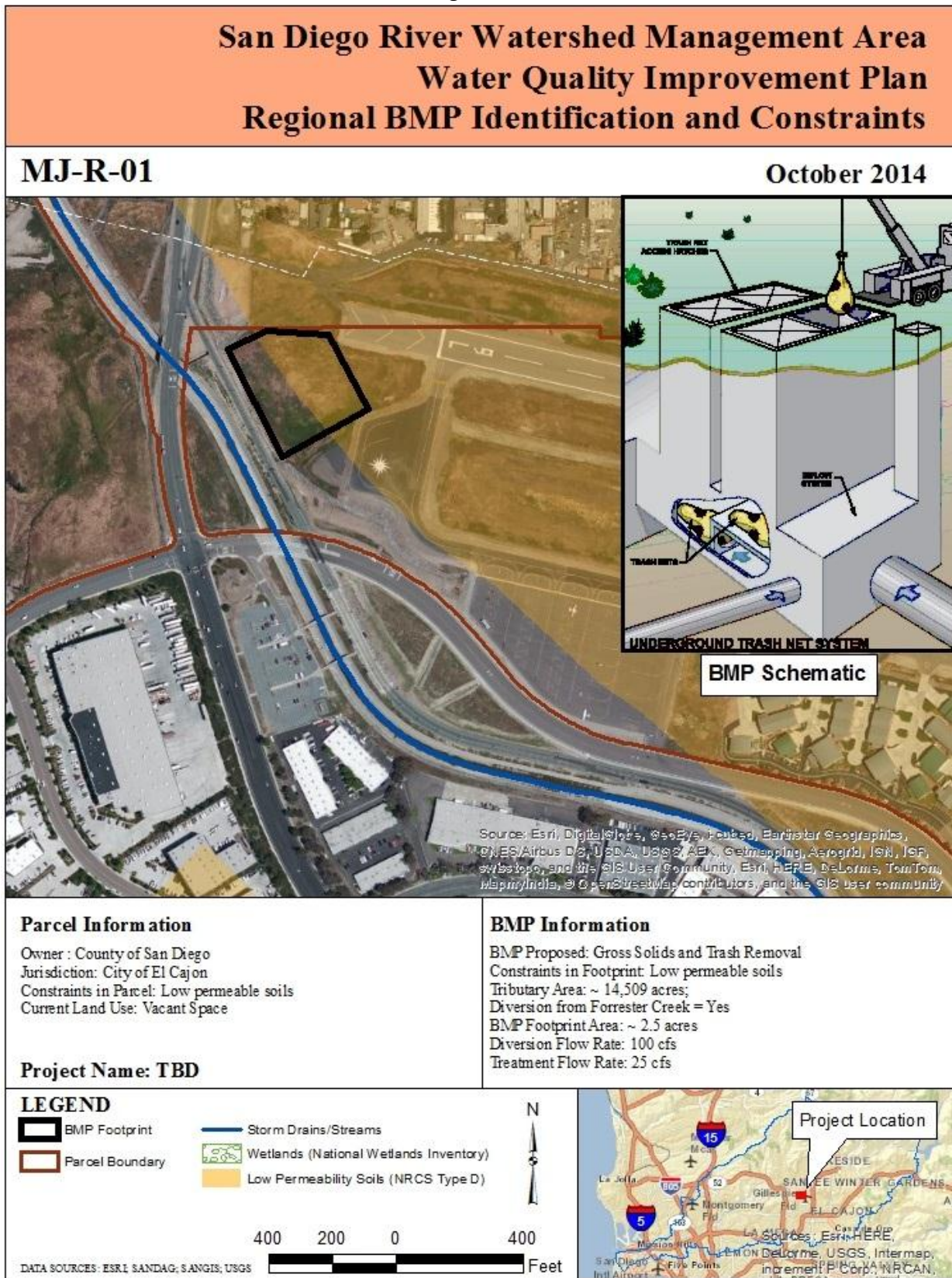


Figure D11.

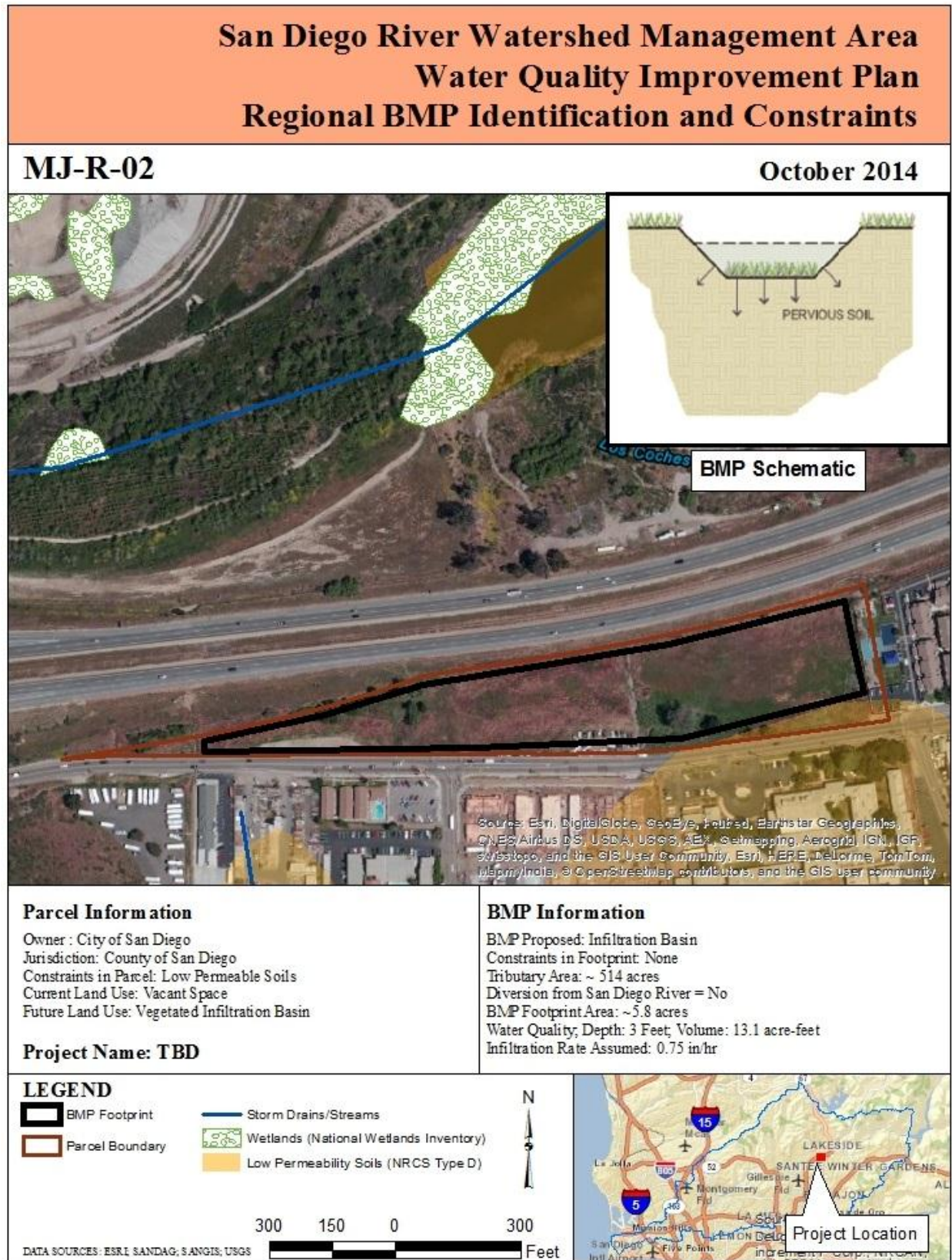


Figure D12.

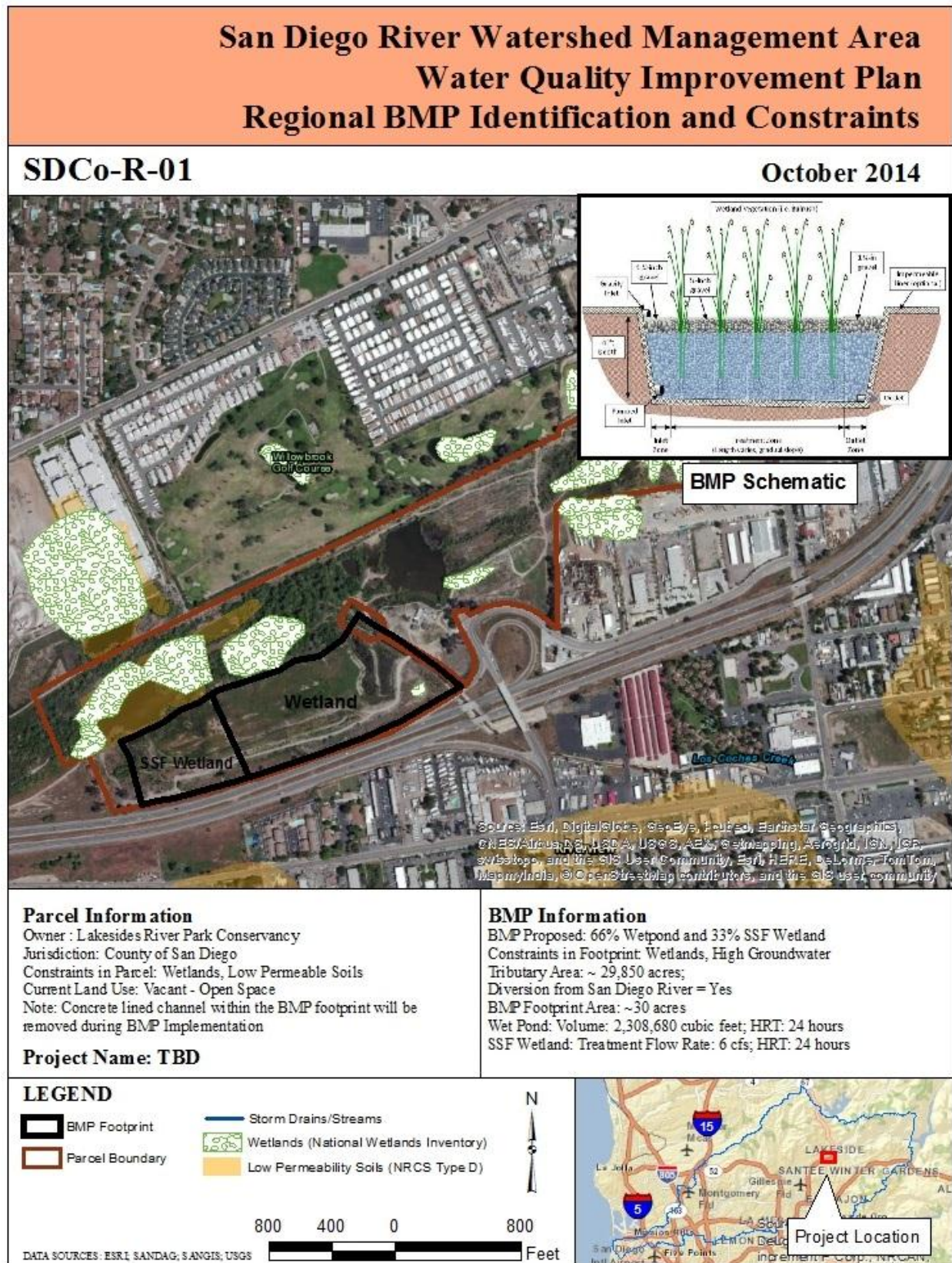


Figure D13.

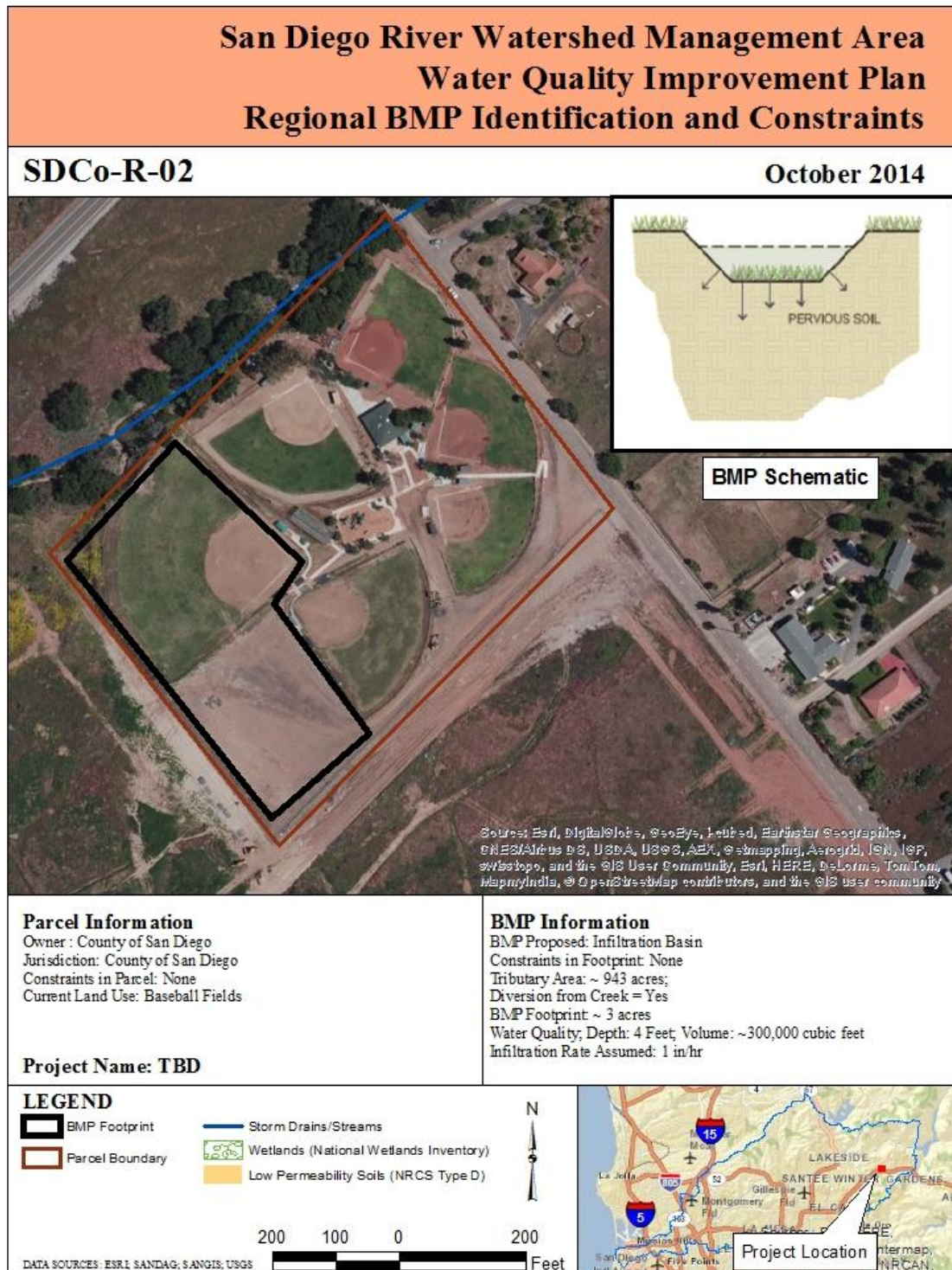
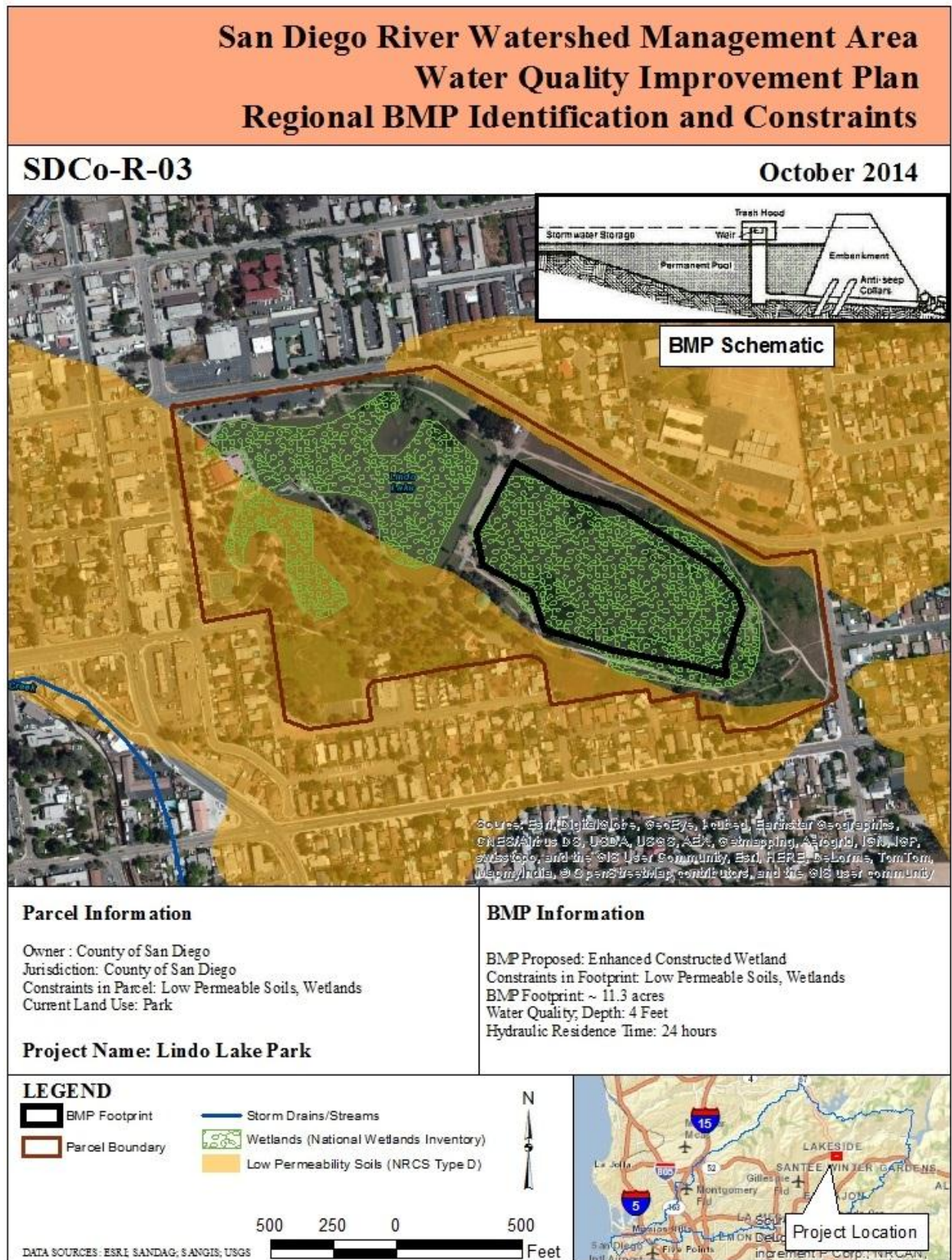


Figure D14.



Load Reduction Quantifications

The estimated load reductions for the proposed regional structural BMPs are presented in Table D6.

Table D6. Estimated Load Reductions from Regional BMPs

Location/Name	Water Quality (FIB-FC Load) Benefits (10 ¹² MPN reduction/year) ^a
	WY 2003 [Low - High]
SDCo-R-01	128 [92 - 145]
SDCo-R-02	14 [10 - 16]
SDCo-R-03	55 [33 - 64]
CoS-R-01	20 [11 - 24]
CoS-R-02	6 [4 - 7]
MJ-R-01	166 [77 - 198]
MJ-R-02	36 [21 - 42]
Totals	425 [248 - 496]

^a Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

Water Quality Benefits and Summary of Estimated Load Reductions

The following sections will describe the benefits expected to result from implementation of the proposed BMPs, including the results of load reduction analyses for the HPWQC and other constituents.

Load Reduction Adjustment Analysis

To improve the reliability of load reduction estimates relative to target load reduction, an analysis was performed to account for overlapping load reductions between structural BMPs. For example, if a given area has both distributed and regional structural BMPs proposed, the estimated load reductions were not assumed to be additive, but rather limited to the lowest effluent concentrations achieved by any structural BMP. Each BMP in the proposed plan was evaluated to identify overlapping load reductions, which were then removed from the total reported benefits to allow a comparison with the target load reduction.

The following assumptions were used for performing the load reduction adjustment analysis:

- Load reductions are uniformly distributed based on the ratio of baseline uncontrolled load.
- Structural BMPs were either categorized as an effluent-based BMP (i.e., BMPs that provide load reduction via treatment only, not volume reduction) or as a volume-reduction BMP (i.e., BMPs that operate on volume reduction primarily).
- For volume-reduction BMPs the overlapping benefits in the captured runoff volume were estimated using the upstream non-overlapping benefits in the captured runoff and the percent load reduction achieved by the BMP.
- For effluent-based BMPs the overlapping benefits in the captured runoff volume were estimated using the upstream non-overlapping benefits in the captured runoff and the total load reduction achieved by the BMP.
- Non-overlapping benefits associated with upstream BMPs in the bypass runoff volume (runoff that exceeds upstream structural BMP design criteria) were considered non-overlapping benefits for the BMP being analyzed.

This load reduction adjustment analysis is an approximate process intended to improve the interpretation of load reduction estimates for use in planning-level assessment of the likelihood of compliance. The degree of precision is intended to be consistent with the degrees of uncertainty relative to sources of loading, BMP performance, ultimate BMP design, interim versus ultimate condition and other factors.

ESTIMATED LOAD REDUCTIONS FOR HPWQC

Table D7 below shows the summary of predicted wet weather load reductions from each BMP type proposed for implementation within the San Diego River Watershed (for all jurisdictions except the City of San Diego) by 2031 as well as the estimated TLR to meet the HPWQC final numeric goal. The table presents the average, low, and high ranges of estimated load reduction. Ranges reflect variability in baseline pollutant loading (e.g., land use EMCs) as well as variability in BMP effectiveness and are represented by the 25th and 75th percentile prediction estimates. Quantification of BMP benefits for this WQIP was assessed based on a number of parameters that have inherent uncertainties and natural variability. Parameters which carry significant uncertainty include storm precipitation, rainfall-runoff response, land uses, infrastructure conditions, EMC data, BMP design and efficiency, site-specific constraints, and cost data. While assessment of potential compliance incorporates a probabilistic assessment, it is recognized that as new data become available, these parameters may change. Furthermore, any translation of BMP performance (in terms of load reduction) to TMDL compliance metrics adds additional uncertainty to the analysis.

Table D7. Summary of Wet Weather Load Reductions from WQIP Analysis

BMP Category ¹	FC Load Reduction (% of Average Municipal Land Use Load) 2003 WY Load [Low-High Range]
Programmatic Strategies	10% [9.2% - 11%]
Potential Public Private Partnership Program	8.5% [1.6% - 15%]
Redevelopment through Permit-Required LID Implementation	4.3% [3.4% - 5.1%]
Distributed Structural BMPs	9.7% [5.2% - 11%]
Regional Structural BMPs	9.2% [5.3% - 11%]
Stream Restoration/Enhancement Projects	1.4% [0.3% - 2.5%]
Load Reduction Adjustment	-4.0% [-1.6% - -5.8%]
Load Reduction Sum	39% [24% - 50%]
Target Load Reduction	34.7%

¹ Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

Other Water Resources Benefits

In addition to the reductions in loading of the HPWQC and other key constituents of concern, the strategies proposed in this WQIP are expected to provide a number of other water resource benefits, including mitigation of physical and biological impairments. More specifically, these benefits include:

- Beneficial Use⁹ of Urban Runoff: Water that is captured and stored in BMPs has the potential to be beneficially harvested and used and thus offset demand for potable water, a critical need within San Diego County.
- Recreation: Larger regional BMPs have the potential to include multi-use elements. In final design of these BMPs there is the opportunity to include features such as trails and bike paths, based on community needs, project partnerships, and site appropriateness that are mutually beneficial to water quality. Distributed BMPs proposed in this WQIP were envisioned as “green streets”, which can enhance the vitality of a commercial or residential avenue and improve the overall quality of life in a neighborhood.
- Wildlife Habitat: In addition to their water quality benefits, BMPs such as regional subsurface flow wetlands may provide additional wetland habitat throughout the San Diego River Watershed that may attract native species.
- Urban Heat Islands: Distributed green streets BMPs may mitigate urban heat island effects (i.e., increased runoff temperatures) by increasing pervious, vegetated areas within heavily urbanized portions of the Watershed.

- Educational Opportunities: Non-structural BMP programs such as Irrigation Runoff Reduction, the Pet Waste Program, and Animal Facilities Management provide the opportunity for public outreach and educational programs that will target behavioral changes, sustainable control at (and avoidance of) the “source”, as well as increased public awareness of and investment in water quality improvement projects.

CITY OF SAN DIEGO - LOAD REDUCTION METHODS INFORMATION FOR ALL WET WEATHER STRUCTURAL BMPs

Watershed modeling simulates the filling, draining, and pollutant removal dynamics of BMPs. These BMPs are broken down into four categories based on the availability of land: (1) centralized BMPs on public land, (2) distributed BMPs on public land, (3) green streets, and (4) centralized BMPs on acquired private land. SUSTAIN was used to model BMP performance and provide cost-benefit optimization within representative catchments. During optimization, BMP sizing was adjusted to optimize the treatment of upstream impervious areas and consider the 85th percentile storm event consistent with existing structural BMP programs. The City of San Diego prioritized jurisdictional catchments by calculating Composite Water Quality Scores for wet and dry weather.

Several analyses were run with a series of scenarios to quantify the effectiveness of each of the structural BMPs on public land first using the SUSTAIN model. The purpose of this section is to summarize the extent to which structural BMPs contribute to pollutant removal in the watershed.

CENTRALIZED BMPs ON PUBLIC LAND

The centralized structural BMPs on public parcels incorporated in the model consisted mostly of detention and infiltration facilities. These features were largely located on soils with low infiltration capacities in the San Diego River watershed.

The City also currently operates five low flow diversion facilities within the San Diego River watershed. These were included in the baseline model of existing conditions and are therefore not included within the flow and pollutant load estimates. Based on review of information on these diversions and communications with City staff, a cumulative diverted flow rate of 2.8 cubic feet per second (cfs) was assumed in the model for these facilities, with individual facility locations and diversion rates represented appropriately.

DISTRIBUTED BMPs ON PUBLIC LAND

Both bioretention and permeable pavement were considered for implementation of distributed BMPs on public parcels. Parcels were screened to identify the opportunity for implementation, accounting for feasibility constraints such as site slope. Both bioretention and permeable pavement options were configured with and without underdrains depending on the underlying soils. For instance, Hydrologic Soil Group B areas were modeled without underdrains and Hydrologic Soil Group C and D areas were modeled with underdrains.

GREEN STREETS

The modeling shows that even the maximum deployment of nonstructural BMPs and centralized and distributed structural BMPs on public land provide only modest pollutant load reductions, well below those needed to meet the WLA reduction requirements. While the above BMPs represent the lowest cost

BMPs for pollutant load reduction, more expensive structural solutions will be required to meet these requirements. The two alternatives considered for this study include green streets and centralized structural BMPs on acquired private land (discussed in the following sub-section). Implementing green streets involves constructing structural BMPs, such as bioretention and permeable pavement in the rights of way of various streets. Although they are more expensive than the previously mentioned BMPs, green streets are very efficient at removing pollutant loads in watersheds because of their proximity to pollutant generating surfaces and their location in the existing surface conveyance infrastructure of the stormwater collection system. Additional advantages of green streets include the fact that they are located in the right of way (and therefore have no land acquisition costs) and are more conveniently accessed for maintenance activities.

A detailed desktop analysis was performed throughout the watershed to evaluate the opportunities for retrofitting existing rights-of-way to green streets. The latest information on road coverage, road type, potential drainage area, soil types, and construction infeasibility was combined to identify the number of potential green streets miles in the watershed. The findings of this analysis were then loaded into SUSTAIN, which comprehensively evaluated and optimized the cost and pollutant removal effectiveness for numerous different combinations of green streets. For the San Diego River Watershed, the implementation of green streets provides sufficient load reductions for the critical pollutant to achieve compliance with WLA targets. Although green streets are expected to provide dry weather load reductions, non-structural BMPs provided 100% load reduction during dry weather so no additional benefits for green streets were quantified in the model.

CENTRALIZED BMPs ON ACQUIRED PRIVATE LAND

Due to the high cost of land acquisition associated with centralized structural BMPs on acquired private land, these BMPs are considered a last resort for implementation to meet necessary load reductions. Therefore, not until other BMP options are exhausted will centralized BMPs on private land be considered for the City. This gives much needed time for investigation of other more cost-effective BMP alternatives prior to implementation. For instance, research of nonstructural BMPs not presently modeled may provide definitive results for load reductions that can be later incorporated within the modeling analyses and provide a reduction in lieu of the necessity for centralized structural BMPs on private land. Alternatively, implementation of green streets discussed in the previous section may provide a viable alternative should changes in road redevelopment procedures be achieved. Therefore, centralized structural BMPs on private land are meant to be a placeholder in the CLRP with an attempt to quantify the costs of meeting the load reduction targets beyond what can be presently quantified with nonstructural BMPs and structural BMPs on public land.

Unlike the green streets optimization, which was based upon a detailed desktop analysis of BMP opportunities, the optimization of centralized BMPs on private land was founded on a higher level planning analysis due to the unknown locations and availability of private land acquisition. Specific spatial and climatic characteristics of each individual subwatershed were loaded into SUSTAIN and hypothetical BMPs were simulated with a fixed drainage area necessary to capture the design storm. The optimization analysis included numerous combinations of BMP location and size scenarios to develop a cost effectiveness curve, as an alternative to the green streets approach. For the San Diego River Watershed, the implementation of centralized BMPs on private land provides sufficient load reductions for the critical pollutant to achieve compliance with WLA targets.

Table D8 below shows the summary of predicted load reductions from the programs described above within the San Diego River Watershed the City of San Diego by 2031.

Table D8. San Diego River Watershed Wet Weather Bacteria Load Reductions for the City of San Diego

Condition	Fecal Coliform (%)
Wet weather	34.70
Dry weather ¹	100.0

¹Dry weather flow and load reductions reflect only runoff in urban subwatershed.

B.3 CHAPTER APPENDIX E - DRY WEATHER LOAD REDUCTIONS

Dry weather load reductions were calculated using a tiered approach. First, the quantifiable nonstructural BMP load reductions were estimated then the gap between these aggressive source control programs and the TMDL required reduction level was filled using dry weather structural solutions when necessary.

The dry weather load reduction quantification approach involves similar steps for the suite of dry weather nonstructural BMPs included in this WQIP (including irrigation runoff reduction and commercial/industrial good housekeeping). The first step was to calculate the load generated by the targeted pollutant source that the BMP will address, by using a percentage of the total Participating Agency pollutant baseline load⁶ which was taken from source tracking studies. Once the targeted pollutant source load was calculated, the potential load reduction benefit was calculated using the estimated effectiveness of the selected BMP. These values were based on literature when available, and if not, on best professional judgment. In both cases, predicted levels of uncertainty are high. The following sections provide a brief description of the specific quantification approach for each dry weather nonstructural BMP, along with relevant assumptions and assumption explanations.

Additionally, some dry weather structural controls may also be implemented to achieve the TMDL required reduction levels. These dry weather structural BMPs may include but are not limited to: low flow diversions to sewers, storm drain lining, catch basin dry wells, street gutter permeable pavement, bioretention swales, regional BMPs, etc.

Table E1 provides a summary of the dry weather quantification results and corresponding assumptions and references. The following sections provide a brief description of the specific quantification approach for each dry weather nonstructural BMP, along with relevant assumptions and assumption explanations.

IRRIGATION RUNOFF REDUCTION AND GOOD LANDSCAPING PRACTICES

The portion of the Participating Agency average dry weather FIB load resulting from commercial and residential runoff was estimated using the best professional judgment of Geosyntec Consultants. Based on findings from the San Diego River source tracking study (Weston 2009a), 59-80 percent of commercial and residential runoff is from irrigation. The implementation of this BMP is estimated to reduce irrigation runoff from commercial and residential areas by 25 to 50 percent as found by Berg et al. (2009) in a study in Orange County.

COMMERCIAL/INDUSTRIAL GOOD HOUSEKEEPING

⁶ The baseline load was assumed to be proportional to the flow (i.e. if x% of the flow was from irrigation runoff than, x% of the load was from irrigation runoff).

The dry weather loading of fecal coliform from commercial activities runoff was determined using the same approach as for irrigation runoff. The runoff load attributed to commercial areas was estimated using the best professional judgment of Geosyntec Consultants. The San Diego River study found that 15-27 percent of commercial flows are from commercial activities targeted by good housekeeping, such as dumpster leaks and wash-down. The reduction achieved through enhancements was based on the current rate of inspection coverage and effectiveness found in the San Diego County JURMP annual report.

ADDITIONAL DRY WEATHER BENEFITS

In addition to the non-storm water flow reduction strategies described above, various pollutant source control BMPs that are being used for wet weather compliance will also have pollutant reduction benefits during dry weather. These BMPs will include the following program enhancements (i.e., beyond the Permit minimum), with an emphasis on those BMPs that most effectively target urban storm water bacteria sources:

- Street and median sweeping;
- MS4 cleaning;
- Education/outreach and inspection/enforcement to target specific known sources of bacteria and fecal waste, such as:
 - Commercial and food outlets (wash down practices, dumpster and grease trap management, etc.),
 - Pet owners,
 - Equestrian owners/recreators and owners of rural farm animals, and
 - Septic owners; and
- Good landscaping practices.

Table E1.

San Diego River Summary of Dry Weather Quantification of Water Quality Benefits

BMP Name	Wet or Dry Weather	Land Use Targeted	Pollutant Generating Activity	Quantification Assumptions			Quantification Method	Expected Annual Reduction of MS4 Baseline Load ¹ by 2021		
				Load Assumption	Units	Citation/Assumptions		Fecal Coliform (percent)		
								Low Range	High Range	
Irrigation Runoff Reduction Enhancements (Incentatives, outreach, and education)	Dry Weather	Residential and Commercial	Irrigation runoff, fertilizers/compost, soil and decaying plant matter, green waste	2.8	10 ^12 Monthly Average MS4 FIB-FC dry-weather load in watershed excluding city of San Digeo areas	Calculated by TMDL model, which was calibrated to monitoring data	(monthly bacteria load) * (12 months per year) * (percent bacteria from runoff) * (percent of runoff from irrigation) * (expected behavior change)	7.4%	33%	
				50-80%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial and residential runoff	Best Professional Judgement				
				59-80%	Percent of commercial and residential runoff load generated residential and commercial from irrigation	San Diego River Source ID study, 2009				
				25-50%	Percent reduction in irrigation runoff from irrigation control incentives	Orange County irrigation runoff study, 2004				
Commercial/Industrial Good Housekeeping Enhancements (Inspection, enforcement, outreach)	Dry Weather and Wet Weather	Commercial and Industrial	Dumpsters, outdoor garbage areas, garbage trucks, grease bins, outdoor dining/fast food, washwater	2.8	10 ^12 Monthly Average MS4 FIB-FC dry-weather load in watershed excluding city of San Digeo areas	Calculated by TMDL model, which was calibrated to monitoring data	(monthly bacteria load) * (12 months per year) * (percent bacteria from runoff) * (percent of runoff from commercial activities) * (increase in inspection) * (expected behavior change)	0.7%	5.4%	
				25-40%	Percent of MS4 dry-weather flows (and fecal bacteria loads) from commercial and indsutrial runoff	Best Professional Judgement				
				15-27%	Percent of commercial and industrial runoff load generated from commercial and industrial activities	San Diego River Source ID study, 2009				
				25-50%	Percent of commercial and industrial area covered by increased inspection	San Diego County JURMP				
				75-100%	Percent reduction in bacteria loads from enhanced inspections	San Diego County JURMP				
Dry Weather Structural BMPs (low flow diversions to sewers, stormdrain lining, catch basin dry wells, street gutter permeable pavement, bioretention swales, regional BMPs)	Dry Weather and Wet Weather	All Land uses	All Nonstormwater Flows	69.4%	Percent reduction of MS4 FIB-FC dry-weather load to comply with the MS4 permit	San Diego MS4 Permit, Attachment E	(MS4 required percent reduction) - (estimated percent reduction achieved by nonstructural BMPs)	61%	31%	
Dry Weather Total								% of average MS4 total load (33.6 10^12 MPN)	69.4%	69.4%

1. Load reductions do not include benefits from nonstructural BMPs in the City of San Diego.

B.3 CHAPTER APPENDIX F – OPTIONAL WATERSHED MANAGEMENT AREA ANALYSIS (WMAA) CANDIDATE PROJECTS

CITY OF EL CAJON

Project Identifier	Watershed Management Area	Hydrologic Area (HA)	Hydrologic Subarea (HSA)	Jurisdiction	Project Name	Ownership		Project Location				Project Origination/Originator		Project Category	Specific Project Type
						Type	Owner Information	Address	APN	Latitude	Longitude	Name	Contact Information		
SDR-10	San Diego River	Lower San Diego	El Cajon	EL CAJON	MJ-R-D-1	Public	S.D. COUNTY	N. MARSHALL AVE. AND CUYAMACA ST., EL CAJON, CA	3871900800	1882196.91	6336553.33	S.D. COUNTY, CITY OF S.D., CITY OF LA MESA, CITY OF EL CAJON, CITY OF SANTEE		Regional BMPs	GROSS SOLIDS AND TRASH REMOVAL

City of San Diego
San Diego River Watershed Management Area Assessment Project List

Project Identifier	Watershed Management Area	Jurisdiction	Ownership	Project Location				Project Size & Parameters				Other Notes
			Owner Information	Address	APN	Latitude (X-Coordinate)	Longitude (Y-Coordinate)	Contributing Drainage Area (acres)	Parcel Size (acres)	Project Footprint (acres)	Parameters (with units as necessary)	
Public Parcels Identified as Suitable for Further Assessment to Determine Feasibility of Retrofitting with Green Infrastructure												
Parcels on this list that are 0.25 acres or greater have been assessed using broad assumptions necessary for computer modeling and were found to be potentially effective as an opportunity for contributing to load reduction goals. Considerable further assessment would be required before determining any of these sites to be viable retrofit sites for implementation of Green Infrastructure. That assessment includes verifying public ownership, determining if land use agreements and financing can be established, assessing feasibility based upon further investigation of physical site constraints at a project design level, and determining that construction and necessary approvals, including approvals from regulatory agencies other than the City of San Diego, can be completed within the time constraints in the Municipal Storm Water Permit that pertain to Alternative Compliance.												
1	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4365400600	6271960.61690000000	1858885.13726000000	TBD	8.43	TBD	TBD	TBD
2	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4365400700	6271959.81782000000	1859293.03247000000	TBD	3.91	TBD	TBD	TBD
3	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210305400	6291729.82911000000	1875381.08817000000	TBD	4.07	TBD	TBD	TBD
4	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4411600400	6263428.84682000000	1855426.39730000000	TBD	7.68	TBD	TBD	TBD
5	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4821705000	6339801.31690000000	1875760.30229000000	TBD	1.22	TBD	TBD	TBD
6	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4830212800	6340225.66102000000	1876652.51839000000	TBD	0.92	TBD	TBD	TBD
7	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4498608300	6258864.54200000000	1855043.39600000000	TBD	1.57	TBD	TBD	TBD
8	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4313202100	6278852.82234000000	1866133.79441000000	TBD	1.58	TBD	TBD	TBD
9	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4212910200	6290284.19036000000	1874074.87660000000	TBD	1.63	TBD	TBD	TBD
10	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3822601200	6349893.72700000000	1891724.34900000000	TBD	7.84	TBD	TBD	TBD
11	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4491100800	6258923.84207000000	1853753.85700000000	TBD	3.80	TBD	TBD	TBD
12	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4631110100	6312244.38913000000	1865532.18088000000	TBD	0.23	TBD	TBD	TBD
13	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690402300	6289856.34251000000	1884716.71162000000	TBD	4.32	TBD	TBD	TBD
14	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210305600	6292567.83850000000	1875157.25309000000	TBD	3.60	TBD	TBD	TBD
15	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4426212000	6271214.16355000000	1855369.84926000000	TBD	1.73	TBD	TBD	TBD
16	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4821902100	6338457.74796000000	1872745.29350000000	TBD	1.68	TBD	TBD	TBD
17	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3870300500	6342314.66959000000	1881981.04938000000	TBD	0.88	TBD	TBD	TBD
18	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3941410600	6355018.57753000000	1892436.00776000000	TBD	0.17	TBD	TBD	TBD
19	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4365400800	6271268.62875000000	1859124.10526000000	TBD	1.39	TBD	TBD	TBD
20	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210305500	6292202.78233000000	1875304.80864000000	TBD	3.17	TBD	TBD	TBD
21	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4498700300	6260981.53292000000	1854769.59111000000	TBD	6.16	TBD	TBD	TBD
22	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4332501600	6294188.80695000000	1865293.28405000000	TBD	132.19	TBD	TBD	TBD
23	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3941410700	6355025.47597000000	1892389.32099000000	TBD	0.17	TBD	TBD	TBD
24	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4640901300	6320460.93349000000	1864753.29555000000	TBD	0.48	TBD	TBD	TBD
25	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210400700	6285991.12254000000	1874972.35651000000	TBD	0.69	TBD	TBD	TBD
26	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4415900500	6264267.50968000000	1856432.59103000000	TBD	5.23	TBD	TBD	TBD
27	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210306100	6291246.94719000000	1875814.34568000000	TBD	14.23	TBD	TBD	TBD
28	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3734900600	6304064.40091000000	1885160.24024000000	TBD	5.24	TBD	TBD	TBD
29	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210306000	6291854.30037000000	1876419.91264000000	TBD	99.22	TBD	TBD	TBD
30	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4212901100	6287850.14331000000	1877338.88703000000	TBD	409.77	TBD	TBD	TBD
31	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4640700900	6319937.71057000000	1864931.80787000000	TBD	2.27	TBD	TBD	TBD
32	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4210500100	6286133.58650000000	1874150.64150000000	TBD	11.35	TBD	TBD	TBD
33	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4425200800	6270702.20031000000	1856524.21687000000	TBD	11.90	TBD	TBD	TBD
34	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6724900500	6306195.90236000000	1869360.48157000000	TBD	0.52	TBD	TBD	TBD

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35	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3562310300	6285679.783090000000	1880196.67901000000	TBD	1.33	TBD	TBD	TBD
36	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4367300500	6272175.03471000000	1858241.73568000000	TBD	18.93	TBD	TBD	TBD
37	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4312900200	6278823.678000000000	1867469.96914000000	TBD	0.22	TBD	TBD	TBD
38	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4495910300	6260495.09176000000	1850354.07084000000	TBD	0.26	TBD	TBD	TBD
39	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4494721300	6260320.56442000000	1850616.08091000000	TBD	0.23	TBD	TBD	TBD
40	San Diego River	City of San Diego	CITY OF SAN DIEGO(OCEAN BEACH RECREATION CENTE	TBD	4484020800	6255666.55073000000	1852339.12233000000	TBD	1.23	TBD	TBD	TBD
41	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4446503600	6280232.33314000000	1853728.47389000000	TBD	0.45	TBD	TBD	TBD
42	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4495821800	6260245.76160000000	1849447.82320000000	TBD	0.13	TBD	TBD	TBD
43	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480230200	6253699.18708000000	1854690.32675000000	TBD	0.17	TBD	TBD	TBD
44	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480210200	6253562.15184000000	1854338.51592000000	TBD	0.29	TBD	TBD	TBD
45	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690402200	6289474.02403000000	1885098.78900000000	TBD	1.78	TBD	TBD	TBD
46	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3921202000	6355379.75839000000	1896091.09117000000	TBD	0.66	TBD	TBD	TBD
47	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690402500	6289738.99394000000	1885217.57139000000	TBD	3.30	TBD	TBD	TBD
48	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4212900900	6284861.04809000000	1876285.71277000000	TBD	4.64	TBD	TBD	TBD
49	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4905920200	6325682.31916000000	1863837.62462000000	TBD	0.19	TBD	TBD	TBD
50	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4641500500	6317490.68047000000	1864623.66893000000	TBD	3.74	TBD	TBD	TBD
51	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4365200600	6271142.44352000000	1859047.80426000000	TBD	0.43	TBD	TBD	TBD
52	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4213201100	6285346.12043000000	1874037.59826000000	TBD	2.48	TBD	TBD	TBD
53	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4381504100	6287165.54078000000	1858468.04078000000	TBD	0.05	TBD	TBD	TBD
54	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4212050700	6288077.35470000000	1873946.75638000000	TBD	0.34	TBD	TBD	TBD
55	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4332501900	6293802.54477000000	1863818.43052000000	TBD	0.75	TBD	TBD	TBD
56	San Diego River	City of San Diego	HOUSING AUTHORITY CITY OF SAN DIEGO	TBD	4410904300	6259836.56184000000	1855650.37597000000	TBD	30.18	TBD	TBD	TBD
57	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4365300700	6271285.86682000000	1858506.99406000000	TBD	3.59	TBD	TBD	TBD
58	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4481421500	6255760.59837000000	1855602.76543000000	TBD	4.72	TBD	TBD	TBD
59	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4483011200	6255031.53413000000	1852488.22504000000	TBD	0.31	TBD	TBD	TBD
60	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4483011300	6254970.71662000000	1852531.09105000000	TBD	0.17	TBD	TBD	TBD
61	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4405621400	6294451.46966000000	1858174.02469000000	TBD	0.19	TBD	TBD	TBD
62	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690402400	6290053.71214000000	1884529.00398000000	TBD	0.12	TBD	TBD	TBD
63	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4292600500	6296323.32065000000	1870275.17901000000	TBD	0.94	TBD	TBD	TBD
64	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4406401500	6297100.41175000000	1858428.57650000000	TBD	1.61	TBD	TBD	TBD
65	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6724900400	6306327.73599000000	1869653.82859000000	TBD	3.81	TBD	TBD	TBD
66	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3734825700	6305446.72610000000	1885079.04244000000	TBD	0.05	TBD	TBD	TBD
67	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3691702400	6290461.04004000000	1879145.59875000000	TBD	4.38	TBD	TBD	TBD
68	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3920903300	6354563.85941000000	1896080.45007000000	TBD	11.43	TBD	TBD	TBD
69	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4571910900	6329229.84314000000	1872215.84076000000	TBD	0.06	TBD	TBD	TBD
70	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4488000100	6255963.33149000000	1855387.22038000000	TBD	2.24	TBD	TBD	TBD
71	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4631150200	6312874.15265000000	1865311.84055000000	TBD	0.20	TBD	TBD	TBD
72	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4480310400	6253701.82783000000	1855277.48305000000	TBD	2.29	TBD	TBD	TBD
73	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4406302100	6297336.59475000000	1857832.31025000000	TBD	0.13	TBD	TBD	TBD
74	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3920820500	6355272.81129000000	1896450.04317000000	TBD	0.95	TBD	TBD	TBD
75	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690401800	6290155.86150000000	1884841.55675000000	TBD	2.26	TBD	TBD	TBD
76	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4571911000	6329230.68418000000	1872290.35859000000	TBD	0.05	TBD	TBD	TBD
77	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4413702100	6263016.97365000000	1855507.62373000000	TBD	0.31	TBD	TBD	TBD
78	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4571910800	6329229.09547000000	1872152.76529000000	TBD	0.09	TBD	TBD	TBD
79	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480233300	6253708.41501000000	1854889.23835000000	TBD	0.07	TBD	TBD	TBD
80	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6723000100	6306309.53263000000	1870229.29455000000	TBD	10.00	TBD	TBD	TBD
81	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480233100	6253747.05150000000	1854860.55682000000	TBD	0.09	TBD	TBD	TBD
82	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3830800500	6329701.97900000000	1885454.06300000000	TBD	0.56	TBD	TBD	TBD
83	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4213920100	6295098.51652000000	1879029.44163000000	TBD	2.51	TBD	TBD	TBD
84	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4415303800	6266415.00735000000	1857123.35748000000	TBD	0.35	TBD	TBD	TBD
85	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3921202100	6355446.89802000000	1896472.95302000000	TBD	0.18	TBD	TBD	TBD
86	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4562311800	6313898.75734000000	1875835.44960000000	TBD	0.14	TBD	TBD	TBD

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87	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480230300	6253730.232690000000	1854666.112730000000	TBD	0.09	TBD	TBD	TBD
88	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690401400	6289290.363760000000	1884800.260810000000	TBD	1.94	TBD	TBD	TBD
89	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4213920300	6295050.339050000000	1878608.691890000000	TBD	1.87	TBD	TBD	TBD
90	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4213330400	6295808.351250000000	1875844.907410000000	TBD	1.20	TBD	TBD	TBD
91	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4366700600	6269821.546000000000	1858353.659000000000	TBD	3.88	TBD	TBD	TBD
92	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4365200300	6270925.142250000000	1858614.333330000000	TBD	2.05	TBD	TBD	TBD
93	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480101700	6253469.277060000000	1853841.897130000000	TBD	1.59	TBD	TBD	TBD
94	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4673502300	6312536.288060000000	1859990.292260000000	TBD	1.57	TBD	TBD	TBD
95	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4391803100	6292003.034640000000	1859796.733460000000	TBD	0.08	TBD	TBD	TBD
96	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3921103000	6355080.125450000000	1894998.705280000000	TBD	0.03	TBD	TBD	TBD
97	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3562130800	6285671.428320000000	1880808.745470000000	TBD	1.77	TBD	TBD	TBD
98	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6730400100	6313197.822110000000	1868679.513970000000	TBD	10.69	TBD	TBD	TBD
99	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6720803600	6309440.611300000000	1871513.557140000000	TBD	0.13	TBD	TBD	TBD
100	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6720802100	6309247.095330000000	1871323.724320000000	TBD	0.16	TBD	TBD	TBD
101	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4213920400	6295037.388440000000	1878368.610790000000	TBD	2.04	TBD	TBD	TBD
102	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4332500500	6292768.988400000000	1863328.696350000000	TBD	2.95	TBD	TBD	TBD
103	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690401900	6289956.237500000000	1885008.156750000000	TBD	0.86	TBD	TBD	TBD
104	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6720704900	6309804.627830000000	1871882.587260000000	TBD	0.13	TBD	TBD	TBD
105	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4495910100	6260481.407360000000	1850483.585870000000	TBD	0.47	TBD	TBD	TBD
106	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480411900	6253967.483790000000	1855498.860860000000	TBD	0.42	TBD	TBD	TBD
107	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4392402800	6292006.204190000000	1859730.178940000000	TBD	0.07	TBD	TBD	TBD
108	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4870602500	6337670.660600000000	1871061.195950000000	TBD	1.12	TBD	TBD	TBD
109	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4674022400	6310442.058140000000	1858330.761740000000	TBD	0.12	TBD	TBD	TBD
110	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6720804300	6309620.779990000000	1871697.636650000000	TBD	0.13	TBD	TBD	TBD
111	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3871214800	6340834.313270000000	1878064.508410000000	TBD	0.25	TBD	TBD	TBD
112	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4366011000	6272889.103450000000	1859503.096610000000	TBD	0.32	TBD	TBD	TBD
113	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4674022500	6310443.189630000000	1858381.197140000000	TBD	0.12	TBD	TBD	TBD
114	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4415900600	6263915.259270000000	1856024.579090000000	TBD	5.55	TBD	TBD	TBD
115	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3830501500	6321576.308020000000	1886091.558340000000	TBD	19.83	TBD	TBD	TBD
116	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6740400100	6319421.218630000000	1868148.000000000000	TBD	0.49	TBD	TBD	TBD
117	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4830212700	6340556.019130000000	1877394.800760000000	TBD	0.15	TBD	TBD	TBD
118	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4480503600	6254577.813000000000	1855776.052000000000	TBD	1.00	TBD	TBD	TBD
119	San Diego River	City of San Diego	HOUSING AUTHORITY CITY OF SAN DIEGO	TBD	4411330100	6261951.489420000000	1856430.350040000000	TBD	0.53	TBD	TBD	TBD
120	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4405622900	6294888.898400000000	1858466.196780000000	TBD	1.46	TBD	TBD	TBD
121	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4213920200	6295077.959990000000	1878798.827550000000	TBD	1.67	TBD	TBD	TBD
122	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4332501300	6294341.455860000000	1866324.122200000000	TBD	81.07	TBD	TBD	TBD
123	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4415900400	6265417.408960000000	1856122.645450000000	TBD	69.11	TBD	TBD	TBD
124	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4674022300	6310440.914290000000	1858279.770330000000	TBD	0.12	TBD	TBD	TBD
125	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3690840500	6294037.673740000000	1884851.166670000000	TBD	7.57	TBD	TBD	TBD
126	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4364902000	6270654.935190000000	1858667.679010000000	TBD	0.11	TBD	TBD	TBD
127	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480220100	6253572.023700000000	1854949.796300000000	TBD	0.61	TBD	TBD	TBD
128	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6722702500	6307300.347380000000	1869232.445380000000	TBD	0.52	TBD	TBD	TBD
129	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3733022600	6301507.473540000000	1885150.075900000000	TBD	1.48	TBD	TBD	TBD
130	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4446901500	6282879.186990000000	1853393.903230000000	TBD	0.15	TBD	TBD	TBD
131	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4372911600	6281036.429900000000	1860056.268310000000	TBD	0.31	TBD	TBD	TBD
132	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4366900700	6270371.000000000000	1858512.658000000000	TBD	2.52	TBD	TBD	TBD
133	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4673601300	6313088.109300000000	1860503.494850000000	TBD	0.11	TBD	TBD	TBD
134	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480230100	6253631.086450000000	1854745.016760000000	TBD	0.40	TBD	TBD	TBD
135	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4681612700	6316028.857070000000	1860901.742850000000	TBD	0.22	TBD	TBD	TBD
136	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4394413700	6293575.620450000000	1858445.331550000000	TBD	0.15	TBD	TBD	TBD
137	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4332304600	6291814.773950000000	1863537.826520000000	TBD	2.35	TBD	TBD	TBD
138	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4622102900	6308564.819320000000	1865254.065550000000	TBD	4.02	TBD	TBD	TBD

City of San Diego
San Diego River Watershed Management Area Assessment Project List

139	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4494720200	6260267.76877000000	1850650.71282000000	TBD	0.06	TBD	TBD	TBD
140	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480233400	6253689.11331000000	1854902.72886000000	TBD	0.08	TBD	TBD	TBD
141	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4586230100	6306150.05787000000	1867911.12374000000	TBD	0.73	TBD	TBD	TBD
142	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3735212800	6305183.90224000000	1886762.04497000000	TBD	0.16	TBD	TBD	TBD
143	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4422601900	6269417.11896000000	1856255.53774000000	TBD	0.09	TBD	TBD	TBD
144	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4394413600	6293574.78400000000	1858395.33598000000	TBD	0.15	TBD	TBD	TBD
145	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480210100	6253524.17471000000	1854285.49230000000	TBD	0.14	TBD	TBD	TBD
146	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480210400	6253552.32944000000	1854558.38742000000	TBD	0.32	TBD	TBD	TBD
147	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480210300	6253530.73423000000	1854453.20193000000	TBD	0.19	TBD	TBD	TBD
148	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4366601900	6269173.06771000000	1857962.88617000000	TBD	0.72	TBD	TBD	TBD
149	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4332303400	6291498.56307000000	1863079.31481000000	TBD	18.01	TBD	TBD	TBD
150	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4400313700	6299555.90072000000	1862888.94314000000	TBD	0.14	TBD	TBD	TBD
151	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3735004900	6303410.14495000000	1886765.03210000000	TBD	0.24	TBD	TBD	TBD
152	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4681700700	6314310.33009000000	1860315.32716000000	TBD	0.02	TBD	TBD	TBD
153	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3660814900	6323908.98108000000	1888514.07648000000	TBD	0.16	TBD	TBD	TBD
154	San Diego River	City of San Diego	CITY OF SAN DIEGO TR	TBD	4480233200	6253726.41679000000	1854875.74090000000	TBD	0.08	TBD	TBD	TBD
155	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4482302200	6256565.36122000000	1854564.37184000000	TBD	0.15	TBD	TBD	TBD
156	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4484211200	6256726.71361000000	1853674.35503000000	TBD	0.18	TBD	TBD	TBD
157	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3920810300	6354844.07132000000	1896530.61115000000	TBD	0.52	TBD	TBD	TBD
158	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4641500300	6317607.83356000000	1864865.33360000000	TBD	0.23	TBD	TBD	TBD
159	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6721203600	6308575.21401000000	1870690.59846000000	TBD	0.19	TBD	TBD	TBD
160	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6721303300	6308793.20165000000	1870904.81496000000	TBD	0.16	TBD	TBD	TBD
161	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4620511900	6309027.48574000000	1867188.01852000000	TBD	0.04	TBD	TBD	TBD
162	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6721300200	6309031.96128000000	1871125.51034000000	TBD	0.14	TBD	TBD	TBD
163	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4415810900	6266916.57254000000	1856500.37432000000	TBD	0.01	TBD	TBD	TBD
164	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4446901600	6282931.73301000000	1853394.16435000000	TBD	0.16	TBD	TBD	TBD
165	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3710310400	6310651.98763000000	1878510.00185000000	TBD	0.15	TBD	TBD	TBD
166	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	6770360900	6283662.03979000000	1868621.46220000000	TBD	0.14	TBD	TBD	TBD
167	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	3660503200	6329521.56912000000	1898594.50349000000	TBD	4.59	TBD	TBD	TBD
168	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4411821900	6263482.47362000000	1856195.71176000000	TBD	0.04	TBD	TBD	TBD
169	San Diego River	City of San Diego	CITY OF SAN DIEGO	TBD	4400111700	6297774.14941000000	1862842.38430000000	TBD	0.02	TBD	TBD	TBD
Public Parcels Identified as Suitable for Further Assessment to Determine Feasibility of Retrofitting												
Parcels on this list have been assessed using broad assumptions necessary for computer modeling and were found to be potentially effective as an opportunity for contributing to load reduction goals. Considerable further assessment would be required before determining any of these sites to be viable retrofit. That assessment includes verifying public ownership, determining if land use agreements and financing can be established, assessing feasibility based upon further investigation of physical site constraints at a project design level, and determining that construction and necessary approvals, including approvals from regulatory agencies other than the City of San Diego, can be completed within the time constraints in the Municipal Storm Water Permit that pertain to Alternative Compliance.												
N/A	N/A	City of San Diego	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Canyon Site
Project Concept for Green Streets Retrofits – Quantity and Location of Suitable City Streets To-Be-Determined												
The City of San Diego is in the process of identifying potential public street locations that could feasibly be retrofitted with Green Infrastructure and provide a meaningful contribution to pollutant load reduction goals. As locations become verified for feasibility and effectiveness, funding mechanisms under an Alternate Compliance program could potentially be used to fill gaps in construction and maintenance funding necessary for the project to go forward. This is pending the ability to establish suitable legal mechanisms and verify that approvals and construction can be completed within the time constraints in the Municipal Storm Water Permit that pertain to Alternative Compliance.												
170	San Diego River	City of San Diego	City of San Diego	TBD	N/A	N/A	N/A	TBD	89	TBD	TBD	Green Street TBD

County of San Diego
San Diego River Watershed Management Area Assessment Project List

Project Identifier	Watershed Management Area	Jurisdiction	Project Name	Ownership		Project Location				Project Category	Specific Project Type
				Type	Owner Information	Address	APN	Latitude	Longitude		
SDR-2	San Diego River	SAN DIEGO	Shepherd Canyon Wetlands Restoration, 6+ Acres		CITY OF SAN DIEGO	N/A	3730715500	1883859.653	6302019.348		
SDR-3	San Diego River	SAN DIEGO	Ruffin Canyon, Free Land from Church, Wetland-Water Filtration		ROMAN CATHOLIC BISHOP OF SAN DIEGO	GLENCOLUM DR	4290101000	1873409.984	6290364.132		
SDR-4	San Diego River	SAN DIEGO	Qualcomm Parking Lot		CITY OF SAN DIEGO	Qualcomm parking lot	4332501600	1865894.05	6294328.208		
SDR-5	San Diego River	SAN DIEGO	St. Columba church canyon area	Private	St. Columba Church	3327 Glencolum Drive, San Diego 92123 The above address is the church address, but the canyon is between the church parking area and Gramercy Drive	4290111000	1873045.19	6290152.379	Stream or Riparian Rehabilitation	Drainage area rehabilitation/restoration
SDR-6	San Diego River	SAN DIEGO	Library Canyon Creek	Public	City of San Diego	9020 Village Glen DriveSan Diego, CA 92123	4210302200	1874517.998	6290493.141	Stream or Riparian Rehabilitation	creek restoration
SDR-1	San Diego River	S.D. COUNTY	Lakeside Conservancy Treatment Wetlands	Public/Private Partnership	Stephanie Gaines 858-694-3493	Lakeside River Park Conservancy 12108 Industry Rd, Lakeside 92040	3822503200	1892675.312	6350636.749	Regional BMP's	Subsurface Treatment Wetlands
SDR-11	San Diego River	S.D. COUNTY	MJ-R-D-4	Public	CITY OF S.D.	WOODSIDE AVE AND SUMMERSUN LANE, LAKESIDE	3822601200	1891735.691	6349833.62	Groundwater Recharge Projects	VEGETATED INFILTRATION BASIN
SDR-7	San Diego River	S.D. COUNTY	Lakeside Conservancy Treatment Wetlands	Public/Private Partnership	Stephanie Gaines 858-694-3493	Lakeside River Park Conservancy 12108 Industry Rd, Lakeside 92040	3822503200	1892675.312	6350636.749	Regional BMP's	Subsurface Treatment Wetlands, REMOVE CONCRETE CHANNEL
SDR-10	San Diego River	EL CAJON	MJ-R-D-1	Public	S.D. COUNTY	N. MARSHALL AVE. AND CUYAMACA ST., EL CAJON, CA	3871900800	1882196.908	6336553.331	Regional BMP's	GROSS SOLIDS AND TRASH REMOVAL
SDR-12	San Diego River	EL CAJON	WING AVENUE FLOOD CONTROL IMPROVEMENTS	Public	S.D. COUNTY	WING AVE. AND BRADLEY AVE., EL CAJON	3871900800	1878741.197	6341639.357	Stream or Riperian Rehabilitation	CHANNEL WIDENING, DEEPENING, AND STABILIZATION
SDR-8	San Diego River	S.D. COUNTY	FLINN SPRINGS AT OAK CREEK	Public/Private Partnership	S.D. COUNTY	FLINN SPRINGS RD AND OAK CREEK RD	3960700700	1892443.175	6374288.121	Regional BMP's	REGIONAL BMP
SDR-9	San Diego River	S.D. COUNTY	SDCO-R-D-2	Public	S.D. COUNTY	FLINN SPRINGS RD AND OAK CREEK RD	3960700300	1892183.914	6374271.571	Groundwater Recharge Projects	SUBSURFACE INFILTRATION
SDR-16	San Diego River	S.D. COUNTY	SDA7 BASIN 050525	Public	FISHBAUGH THOMAS A&ROBIN M	70 FT NW OF ARMENTROUT LN	4024300400	1889269.405	6403009.319	Regional BMP's	BASIN TREATMENT
SDR-13	San Diego River	S.D. COUNTY	SDA7 BASIN 010303	Public	N/A	2400 ALPINE BLVD	4034100800	1884428.875	6404094.705	Regional BMP's	BASIN TREATMENT
SDR-14	San Diego River	S.D. COUNTY	SDA7 BASIN 010317	Public	BRAR CHAMKAUR S&SUKHWINDER K	ALPINE BLVD AND VICTORIA, ALPINE	4040316700	1883968.114	6407286.83	Regional BMP's	BASIN TREATMENT
SDR-15	San Diego River	S.D. COUNTY	SDA7 IN-LINE TREATMENT 010643	Public	S.D. COUNTY	200 FT NE OF FLO DR AND ARNOLD WY	N/A	1884453.626	6401193.025	Regional BMP's	IN-LINE TREATMENT
SDR-17	San Diego River	S.D. COUNTY	SDA7 BASIN OR IN-LINE TREATMENT 011240	Public	POST ROSE M	ARNOLD WAY N OF HARBISON CANYON RD	4034511200	1886662.471	6390044.085	Regional BMP's	BASIN OR IN-LINE TREATMENT
SDR-18	San Diego River	S.D. COUNTY	SDA7 BASIN OR IN-LINE TREATMENT 010840	Public	LAFOND FAMILY TRUST A 08-06-80	100 FT S OF ALPINE BLVD (OFF RAMP FROM I-8 EAST BOUND)	4033811600	1885189.049	6397590.795	Regional BMP's	BASIN OR IN-LINE TREATMENT
SDG-40	San Diego River	S.D. COUNTY	Coleman Creek Rehabilitation	Public	County of San Diego	Coleman Creek located along Julian Road and Coleman Circle	2910404100	1971849.985	6452903.195	Stream Rehabilitation	Filtration in the stream bed