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# **Budget Options for the Municipal Regional Permit**

Report to the  
Transportation, Water, and Infrastructure  
Committee

April 10, 2017

By

Public Works Department

# **2015 Municipal Regional Permit Report to the Transportation, Water, and Infrastructure Committee**

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## **Introduction**

This Options Report to the Transportation, Water, and Infrastructure Committee (Committee) explores and provides recommendations to the Committee for implementing the Municipal Regional Permit adopted by the Regional Water Quality Control Board (Regional Board) in November 2015 (MRP 2.0). This is the third and final report on this topic. The first report to the Committee on June 9, 2016, the Policy Report, provided an overall background and history of past stormwater permits that have led to the current permit, current permit requirements, and policy implications of implementing MRP 2.0. These new permit requirements also have fiscal implications, which were reviewed in detail in the second report to the Committee, the Financial Report, on October 13, 2016.

Since the last meeting before the Committee on October 13, 2016, staff has gathered more detailed information on implementing permit requirements and acquired better data on implementation costs. Staff met with Regional Board staff on December 7, 2016, and reviewed the assumptions and interpretation of permit requirements used to develop estimated implementation costs. There were several interpretations of permit requirements that were incorrect and impacted implementation costs, which are discussed below. Staff also developed a strategic plan to implement MRP 2.0 in the most economical and effective manner. The options and recommendations presented in this report reflect the results of that strategic planning effort.

## **Financial Report Assumptions**

The Financial Report drove home the point that PCB costs were far and away the most expensive provision of MRP 2.0. The report provided a worst case cost scenario, assuming a modest amount of source properties and a small amount of private development treating PCBs, and the County implementing the bulk of the PCB load reduction measures. The worst case scenario cost for the total five-year MRP 2.0 permit is about \$200 million. This is the corrected and updated cost estimate. A complete discussion of the assumptions and corrections is included in Appendix A. To reiterate the overarching role PCBs play in this worst case cost scenario, the cost for PCBs represents 92% of the total five-year permit cost.

## **Best Case Scenario**

Having established the high end of the potential costs with the worst case scenario, perhaps it would be instructive to develop the low end of potential costs with a best case scenario. Since PCB control measures drive the high costs, a best case scenario would involve eliminating or drastically reducing Green Infrastructure implemented by the County. The absolute best case scenario, or Optimal Best Case Scenario, would eliminate any Green Infrastructure project costs incurred by the County. Under this scenario, all PCB load reductions would be met either with source property referrals or private development. The County would still incur costs associated with the additional trash requirements and planning aspects of Green Infrastructure, and increased costs to maintain source properties. Under this Optimal Best Case Scenario, the total five-year permit cost is about \$26 million, and reflects updated cost and assumptions from those used in the Financial Report. This is shown summarized in Table 1 and in more detail in Table 1 Support and Appendix A.

It seems extremely unlikely the County will not have any Green infrastructure project costs. It makes sense, therefore, to look at a second best case scenario, the Conservative Best Case Scenario, where the County has a modest amount of Green Infrastructure retrofit project costs. This scenario assumes the County is responsible for constructing Green Infrastructure projects to meet the minimum required in the permit, which is a 3.51 gram load reduction. To meet this requirement, it is assumed the County would need to implement projects that would treat a 78 acre mix of Old Industrial and Old Urban land uses at a total scenario cost of about \$50 million. This is shown summarized in Table 2 and in more detail in Table 2 Support and Appendix A.

### **Most Likely Scenario**

Exhibit 1 summarizes all three scenarios, showing a range of \$200 million to \$25.8 million/\$49.8 million. This range is too broad to effectively plan and budget for MRP 2.0 compliance costs. For planning purposes, a Most Likely Scenario needs to be developed. There are two critical components in developing such a scenario, the two components that impact County PCB costs the most: source properties and private development. Each of these components is discussed below.

- **Source Properties.** Last year the Contra Costa Clean Water Program (Clean Water Program) contracted with a consultant to identify source properties throughout the County. The consultant researched over 1500 properties and eventually developed a list of source properties shown on Table 3. Table 3 identifies 173.06 grams of PCBs available from source properties to date. MRP 2.0 provides a 50% credit to source properties referred to the Regional Board and 50% credit upon completion of a remediation project. Remediation of source properties often takes many years, certainly beyond the term of this permit, so only 50% credit is allowed with these source properties. This results in a load reduction of about 87 grams. There is a question whether the Regional Board will accept all of these source properties for

referral. However, if they accept all these source properties then the balance needed for meeting the 90 gram load reduction for 2018 is only 3 grams. In 2020 the load reduction need grows to about an additional 100 grams. Due to the 50% credit, this would require identifying source properties with about 200 grams of PCB loading. It makes sense to hire a consultant to scour the County again looking for source properties, but it's unlikely many will be identified, and those that are identified will tend to have smaller yields. At this juncture it seems hopeful to assume this effort could result in identifying 100 grams of PCB loading resulting in 50 grams of load reduction credit.

- **Private Development.** Assuming we identify 50 grams of load reduction through source properties, that means all co-permittees must achieve an additional 50 gram load reduction. A 50 gram load reduction would require treating 578 acres of Old Industrial land or 1650 acres of Old Urban. If a private development fully remediates its project through an approved remediation plan, such as capping the property, then the control measure is allowed 100% credit. If a private development project uses green infrastructure to treat the stormwater and remove PCBs, then credit allowed for the control measure is reduced by a 70% efficiency factor. It is more likely for a project in an Old Industrial area to follow a remediation plan and it is common for a project in an Old Urban area to use green infrastructure. For planning purposes it is assumed that 75% of the Old Industrial land will be subject to remediation and 25% to green infrastructure, while 100% of the Old Urban land is assumed to use green infrastructure. With this assumption then, the total acreage needed for treatment is 640 acres in Old Industrial areas or 2360 acres in Old Urban areas. For comparison purposes, 2360 acres is about the size of El Cerrito. The County's 15.26% share of this is 98 acres in Old Industrial areas or 360 acres in Old Urban areas. To meet MRP 2.0 requirements, the green infrastructure or remediation project treating this acreage must be completed by June of 2020.

If 98 acres in Old Industrial and 360 acres in Old Urban areas are treated by private development, then County development projects will have reduced PCB loads by 8.5 to 10.9 grams. Staff reviewed the amount of PCBs private development projects have treated over the past several years. Table 4 shows the average PCBs treated over the last four years is 0.2 grams per year. Over the five-year permit term this would result in 1.0 grams, quite a bit less than the goal of about 10 grams. This would leave about 9 grams to be treated with County projects at a cost of \$43 million, assuming projects treating a mix of 200 acres in Old Industrial and Old Urban areas.

Adding to the \$43 million cost for PCBs the costs for the other additional provisions plus the MRP 1.0 costs, then the total estimated cost for the most likely scenario over the five-year MRP 2.0 is about \$69 million. This is shown summarized in Table 9 and in more detail in Table 9 Support and Appendix A.



## Strategic Plan Recommendations

Staff has been working on a Strategic MRP 2.0 Implementation Plan to identify the most cost-effective control measures to meet permit compliance. In developing the Strategic Plan, staff first identified the unit cost of load reduction for each control measure. This allowed a comparison of which control measures were more cost-effective. Staff then developed a list of recommended control measures, with the estimated cost for implementing each control measure along with its "pros" and "cons". The recommended control measures are arranged by priority, with Tier 1 measures recommended for implementation in 2017 and Tier 2 measures recommended for further evaluation in 2018. Below are the strategic recommendations for the four additional requirements contained in MRP 2.0.

### 1. PCBs

The unit cost per gram load reduction for each PCB control measure is summarized in Table 5, and the recommended control measures for the FY 2017/18 budget to meet PCB load reduction requirements in 2018 and 2020 are summarized in Table 6. The following is a brief discussion of the top tier recommendations:

- **Green Infrastructure Project.** Even though the implementation cost per gram of this recommendation is high, staff believes it is important to gain experience with developing green infrastructure projects. In addition it shows the County is committed to meeting permit requirements. A project will be scoped out on County owned property that will, to the greatest extent practicable, be multi-objective and enhance the community.
- **Private Development.** Constructing PCB treatment facilities is very expensive and it makes sense to maximize the credit available through private development. There are two recommendations that pertain to identifying and maximizing PCB credits on private development projects.
- **Source Properties.** Identifying source properties and referring them to the Regional Board is the most cost-effective control measure to meet PCB load reduction requirements. Even though the Clean Water Program searched the County last year for source properties, there may still be some opportunities, especially around PG&E facilities and currently operating and/or abandoned railroad operations. There is also a recommendation to work with other agencies in the Bay Area on "mega" source properties that have huge amounts of PCBs, such as former manufacturing sites or closed Army/Navy bases. However, this is a second-tier recommendation as it will take some time to determine the institutional arrangements necessary to achieve it.

- **County Projects.** There are two recommendations that would incorporate green infrastructure into the County's various capital improvement programs. One centers around buildings and would include, for example, construction of building facilities, parking lots, etc. to include green infrastructure features and demolition of buildings to manage proper disposal of caulk and other PCB laden materials. The other centers around infrastructure and would include, for example, construction of roads, parks, airports, etc. Later in this report are two budget proposals, one a constrained, strategic, resource-based budget, and the other an unconstrained compliance-based budget. The approach in the unconstrained budget would be to apply green infrastructure to all projects regardless of location. The approach in the constrained budget would be to remove funding for green infrastructure components in County projects located in New Urban or Open-Space areas and reallocate the funds to a green infrastructure project in an Old Industrial area. This approach maximizes PCB load reduction return on investment.

## 2. Trash

The unit cost per one-percent load reduction for each trash control measure is summarized in Table 7, and the recommended control measures to meet 2017 trash load reduction requirements are summarized in Table 8. The following is a brief discussion of the top tier recommendations:

- **Full Trash Capture Devices.** This measure would appropriate a "not to exceed" budget amount to install full trash capture devices on about 160 drainage inlets. The maximum budget amount is recommended to be \$300,000. This shows a commitment to achieving our trash goals and results in a significant load reduction.
- **On Land Cleanup.** This is the most effective way of meeting the 70% load reduction requirements by June 2017. Contracts are already in place to perform trash pickup services throughout the County. It is fairly straightforward to extend the service area or increase the frequency of service within an existing service area to achieve the best results.
- **Adopt-a-Spot.** This program is patterned after the successful Adopt-a-Road program. In this case neighborhoods can adopt a drainage inlet, drainage facility, or trash area to keep it clean. This program may not be the most cost effective, however, it does add community value and pride in maintaining a clean neighborhood.
- **Plastic Bag/Polystyrene Ban.** To receive a trash load reduction credit for banning plastic bags, the County must identify what load plastic bags represent in the County's trash and how it compares to regional models. Recycle More did a study and found that the local statistics for plastic bags was a 95% match to the

regional model and was able to use the regional model numbers to determine the level of credit (8% for plastic bags and 6% for polystyrene containers). It is assumed this will be representative throughout the County. The County must also demonstrate, through monitoring, the degree to which the ban is being carried out in unincorporated communities. This is a fairly cost-effective control measure and should be pursued. The County would not be able to receive credit for a Polystyrene container ban in 2017 because of the time it would take to develop an ordinance and implementing program, so it is a Tier 2 recommendation. However, it is recommended to fund the ordinance development in FY 2017/18 so credit can be taken before the 80% trash load reduction requirement goes into effect in 2019.

- **Direct Trash Discharge Control Plan.** MRP 2.0 allows the County up to 15% load reduction for controlling problematic sources of trash in creeks, such as homeless encampments and illegal dumping. This load reduction allowance, or offset, is particularly attractive on the one hand as it is like a "tax credit" where the 15% credit is given irrespective of the underlying trash generation area or prior load reduction activities. On the other hand, beginning in 2019 three times more load must be removed to attain the same credit as in 2017. The Plan must outline a comprehensive program to remove trash from creeks and prevent future trash deposit and accumulation. The Plan was submitted on February 1, 2017, and must be approved by the Regional Board. However, it is unclear if the Regional Board will allow the Plan to be applied in the 2017 reporting period or if it will only be allowed in future reporting periods starting in 2018.
- **Creek Cleanups.** This is another 10% maximum allowance similar to the Direct Trash Discharge Control Plan. This control measure is cost-effective as it utilizes volunteer labor to do the bulk of the cleanup work. MRP 2.0 requires creeks to be cleaned out twice a year to qualify for this allowance.

### **3. Green Infrastructure**

Construction of Green Infrastructure facilities is the predominant green infrastructure cost and is included in the PCBs section. The remaining Green Infrastructure requirement costs primarily cover administrative and planning activities. There are no unit costs or a cost comparison table for this work.

### **4. Mercury**

All of the Mercury load reduction requirements are met by implementing PCB control measures. As a result, there are no unit costs or a cost comparison table specific to Mercury.

### **Budget Options for FY 2017/18**

All of the Tier 1 recommendations from Table 6 and Table 8 were used to build a proposed budget for Fiscal Year 2017/18, along with a few select partially-funded Tier 2 recommendations. There were several criteria used to determine which control measures should be recommended for funding. Certainly, cost effectiveness outlined in Tables 5 and 7 was a factor, along with the ability to have a long-term impact on reaching the objective of improving water quality. Two other criteria were also used, the ability for a recommendation to influence or change behavior and the ability to improve an area by adding value to the community.

The proposed budget for Fiscal Year 2017/18 is outlined in Table 10. The budget shows the baseline costs of MRP 1.0, projected from earlier years, and the cost of the MRP 2.0 additional provisions, which added together provide the total MRP 2.0 budget. This budget is also a resource-based budget and constrained to respect the revenue sources available for funding these program activities. Although constrained, it does include some realignment of past funding which is described in more detail below.

Table 11 is a budget which is prepared based on the Most Likely Scenario outlined above and is a significantly larger budget. This budget is beyond our ability to finance with our dedicated revenue source and modest proposed realignments. The green infrastructure cost for Fiscal Year 2017/18 represents an estimated 15% for planning and project development to construct \$43 million in capital projects by 2020. Table 12 shows total costs for the resource-based scenario and the most likely scenario over the five-year permit term. The revenue-based scenario holds a constant \$700,000 cost for PCB load reduction each year.

### **Policy Implications of Budget Realignments**

The proposed resource-based budget outlined in Table 10 includes some realignment of program responsibility and program funding. For the past 20 years there was more than adequate funding from the dedicated Stormwater Utility Assessment 17 (SUA 17) funds to comply with all stormwater permit requirements plus cover costs that were related to but not a specific requirement of the permit. Last year, compliance costs exceeded SUA 17 revenue and the program surplus was depleted. To meet this year's budget, it is necessary to look at some budget realignments which are described in more detail below.

- **Bethel Island Municipal Improvement District.** Many years ago, the Bethel Island Municipal Improvement District (BIMID) petitioned the County to receive some SUA 17 funds for drainage maintenance and water quality activities. This proposed realignment may impact the amount of SUA 17 funds distributed to BIMID depending on the amount of pollution reduction services they perform. Some drainage maintenance was funded throughout the County with SUA 17 in the past, but going forward there will be no SUA 17 funding available for this type of activity.

- **Street Sweeping.** When the Stormwater Utility Assessment was adopted in 1993 it presented a new revenue stream that could be used to fund certain County services. One of those was street sweeping. During MRP 1.0, baseline trash levels were developed and used to calculate compliance for meeting trash reduction requirements. Historic County street sweeping was counted in determining the baseline trash levels, so there is no "credit" for those expenditures in meeting trash reduction targets. A realignment of street sweeping costs could occur by allocating those costs that receive no credit (pre-baseline) to the General Fund. Those street sweeping costs that help meet trash reduction targets would still be paid with SUA 17 funds.
- **Flood Control District subsidies.** The Flood Control District provides flood protection services to many cities and communities in the County. Some watersheds have inadequate funding due to low tax rates that were locked in when Proposition 13 was passed in 1978. In these cases the Flood Control District looks to the city being served to help fund flood protection services. For unincorporated communities the Flood Control District turns to the County. Since 1993, the County has been using SUA 17 funds to help pay for flood protection services in the Wildcat, San Pablo, Rodeo, and Kellogg Creek watersheds. Each year the County spends about \$350,000 per year to fund flood protection services in the unincorporated communities in these watersheds. The proposed realignment of this funding would free up additional SUA 17 revenue for MRP permit compliance.
- **Funding Shifts to Other County Departments.** In the past, SUA 17 funded all activities associated with the stormwater permit, regardless of what department performed the activity. The proposed budget includes realignment of funding to those departments that conduct the permit required activities. For example, other departments conduct industrial and commercial site inspections, inspections for illicit discharges, and have been actively involved in the plastic bag ban program. The proposed budget reflects the reality that MRP 2.0 is a County permit not a Public Works Department permit.
- **Storm Damage.** To complicate the budget discussions this year, the Public Works Department and County must address what is currently estimated to be \$13 million in damage from winter storms.

## **Consequences of Non-Compliance**

The Regional Board must issue the County a stormwater permit as required by and with authority from the Environmental Protection Agency and the federal Clean Water Act. The Regional Board also has authority through State statute that is, in many cases, more stringent than the Clean Water Act. When a permittee is in non-compliance, the Regional Board can issue a Notice of Violation and levy fines of \$37,500 per violation per day through federal authority, and \$10,000 per violation per day



through State authority. The largest exposure from non-compliance, however, is from third party lawsuits. If the Regional Board finds the County in non-compliance it is highly likely the County would lose any lawsuit and face a very expensive settlement agreement or court decision.

## **Conclusion**

It is difficult to plan and budget for MRP 2.0, as the most expensive requirement, PCB load reductions, is not within our control. Satisfying the load reduction requirement starts at the Bay Area level, then is viewed at the County level, and then viewed at the municipal level. The requirement for the Bay Area is to reduce PCB loads by 3 kilograms by 2020. If one agency cleans up a "mega" property resulting in a 3 kilogram reduction, then all Bay Area permittees have met their permit requirement. If the Bay Area goal is not met, then each County must meet its own separate goal. For Contra Costa, our load reduction target is 560 grams countywide. If one of the cities in our County cleans up a highly polluted property that meets the 560 gram target, then all permittees within Contra Costa County have met their requirement. If collectively we do not meet our 560 gram target, then each municipality has a specific load reduction target that must be met, which for unincorporated Contra Costa County is 85.5 grams. So it is possible some other jurisdiction will meet our requirement for us, but if not then we will have to meet it all on our own.

However murky that seems, it is clear we cannot build ourselves out of the PCB load reduction requirement. Not when the costs range up to \$200 million. The proposed resource-based budget demonstrates a commitment to building a green infrastructure project and incorporating green infrastructure into our capital improvement programs. Beyond that, we will have to rely on private development, identifying additional source properties, and negotiating with owners of "mega" source properties to meet our load reduction requirements.

Staff requests direction from the Committee, and recommends implementing the strategies outlined in this report and funded in the resource-based budget, and providing direction on the Next Steps outlined below.

## **Recommended Next Steps**

**Board of Supervisors.** Forward this report to the full Board for approval with a recommendation on an implementation budget.

**Other Departments.** Direct staff to work with the other departments identified in the constrained budget and assess their ability to fund various permit compliance activities as proposed.

**Street Sweeping.** Direct staff to determine where street sweeping can be reduced in pre-2009 areas to reduce impact on the General Fund and identify any resultant impact on community expectations of reducing municipal services.

**Flood Control District Subsidies.** Direct staff to come back to the Committee with a separate report on Flood Control District finances and the subsidies issue.

**BIMID.** Direct staff to review the agreement with BIMID to determine what activities meet pollution reduction permit requirements and can continue to be funded with SUA 17 funds.

**Resource Plan.** Direct staff to prepare a resource plan to provide the staffing and resources necessary to implement the activities proposed in this report.

**Mid-Year Budget Review.** Direct staff to return to the Committee in six months to report on the status of meeting MRP 2.0 permit targets, the cost to date to achieve the targets, the projected costs to complete the work for fiscal year 2017/18, and status of revenue sources needed for permit compliance.

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**Table 1. MRP 2.0 Cost Compliance  
Optimal Best Case Scenario**

Provision No.	MRP 2.0 Additional Requirements	Estimated Expenditures					Totals
		2016	2017	2018	2019	2020	
C.3	Green Infrastructure	\$0	\$91,500	\$41,000	\$889,000	\$43,000	\$1,064,500
C.10	Trash	\$55,000	\$1,494,000	\$2,014,000	\$2,384,000	\$3,154,000	\$9,101,000
C.11 and C.12	Mercury and PCB	\$31,000	\$11,000	\$213,000	\$261,000	\$267,000	\$783,000
<b>Additions Subtotals</b>		\$86,000	\$1,596,500	\$2,268,000	\$3,534,000	\$3,464,000	\$10,948,500
<b>MRP 1.0</b>		\$2,980,000	\$2,980,000	\$2,980,000	\$2,980,000	\$2,980,000	\$14,900,000
<b>Total MRP 2.0</b>		<b>\$3,066,000</b>	<b>\$4,576,500</b>	<b>\$5,248,000</b>	<b>\$6,514,000</b>	<b>\$6,444,000</b>	<b>\$25,848,500</b>

**Table 1 Detailed Support for Optimal Best Case Scenario: PCB Load Reduction with No County GI Retrofit Project Costs**

Provision Number	Requirement	2016	2017	2018	2019	2020
c.iii.2.	Report on land area treated by GI (BASMAA)	\$0	\$0	\$0	\$0	\$5,000
c.iii.3.	Submit a reasonable assurance analysis (included in C.12.c.ii.2)	\$0	\$0	\$0	\$0	\$0
c.iii.4.	Report on PCBs removed with GI	\$0	\$0	\$0	\$2,000	\$2,000
d.i.	Implementation plan for TMDL waste-load allocations (see C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
d.ii.1.	Identify control measures	\$0	\$0	\$0	\$0	\$15,000
d.ii.2.	Implement control measures	\$0	\$0	\$0	\$0	\$5,000
d.ii.3.	Evaluate effectiveness of control measures	\$0	\$0	\$0	\$0	\$16,000
d.iii.	Submit implementation plan (included in C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
e.i.-iii.	Evaluate PCBs in public infrastructure facilities (BASMAA)	\$0	\$0	\$2,000	\$0	0
C.12.f.i.	Manage demolition debris to contain PCBs (see C.12.f.ii.1)	\$0	\$0	\$0	\$0	\$0
f.ii.1.	Develop debris management protocols	\$0	\$0	\$0	\$45,000	\$0
f.ii.2.	Implement debris management protocols	\$0	\$0	\$0	\$5,000	\$0
f.ii.3.	Assessment of debris management effectiveness (BASMAA)	\$0	\$0	\$0	\$0	\$0
f.iii.1.	Report on implementing debris management	\$2,000	\$2,000	\$2,000	\$0	\$0
f.iii.2.	Prepare exemption justification (not applicable)					
f.iii.3.	Report on debris management protocols	\$0	\$0	\$0	\$0	\$2,000
f.iii.4.	Report on applicable buildings	\$0	\$0	\$0	\$0	\$11,000
f.iii.5.	Assessment methodology for load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0
g.i.-iii.	Fate and transport study (SFEI)	\$0	\$0	\$0	\$0	\$0
h.i.-iii.	Risk reduction program (included in MRP 1.0)	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Costs</b>		<b>\$31,000</b>	<b>\$11,000</b>	<b>\$213,000</b>	<b>\$261,000</b>	<b>\$267,000</b>

**Note:**

1. The current distribution method of load reduction within the county is based on the proportional population of each co-permittee. If the Clean Water Program decided to develop an alternative distribution methodology, the estimated cost



**Table 1 Detailed Support for Optimal Best Case Scenario: PCB Load Reduction with No County GI Retrofit Project**  
**Costs**

Provision Number	Requirement	2016	2017	2018	2019	2020
C.12.a.i.	Implement PCB control measures	\$0	\$0	\$0	\$0	\$0
a.ii.1	Identify management areas with control measures	\$11,000	\$0	\$0	\$0	\$0
a.ii.2.	Identify current and new control measures (see C.12.a.ii.1)	\$0	\$0	\$0	\$0	\$0
a.ii.3.	Develop implementation schedule	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000
a.ii.4.	Implement Source Properties control measure	\$0	\$0	\$200,000	\$200,000	\$200,000
a.ii.4.	Implement North Richmon Pump Station control measure	\$0	\$0	\$0	\$0	\$0
a.ii.4.	Implement Street Sweeping control measure	\$0	\$0	\$0	\$0	\$0
a.ii.4.	Implement Green Infrastructure control measure	\$0	\$0	\$0	\$0	\$0
a.iii.1.	Progress report on control measures	\$5,000	\$0	\$0	\$0	\$0
a.iii.2.	Develop status for each Annual Report	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
a.iii.3.	Update on control measures, source properties, milestones (see C.12.a.iii.2)					
a.iii.4.	Alternative load reduction distribution (optional) (see Note 1)	\$0	\$0	\$0	\$0	\$0
b.i.	Develop load reduction assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.ii.	Calculate PCB load reduction each year	\$0	\$5,000	\$5,000	\$5,000	\$5,000
b.iii.1.	Submit assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.2.	Provide PCB load reductions each year (included in C.12.b.ii)	\$0	\$0	\$0	\$0	\$0
b.iii.3	Update assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.4	Alternative load reduction distribution (optional) (see Note 1)					
c.i.	Minimum GI projects for PCBs (see C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.1	Implement GI projects for specified reduction (included in C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.2.	Reasonable assurance analysis on GI projects (BASMAA)	\$0	\$0	\$0	\$0	\$2,000
c.iii.1.	Report on GI and PCB load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0



**Table 2. MRP 2.0 Cost Compliance  
Conservative Best Case Scenario**

Provision No.	MRP 2.0 Additional Requirements	Estimated Expenditures					Totals
		2016	2017	2018	2019	2020	
C.3	Green Infrastructure	\$0	\$91,500	\$41,000	\$889,000	\$43,000	\$1,064,500
C.10	Trash	\$55,000	\$1,494,000	\$2,014,000	\$2,384,000	\$3,154,000	\$9,101,000
C.11 and C.12	Mercury and PCB	\$31,000	\$11,000	\$213,000	\$261,000	\$24,224,000	\$24,740,000
<b>Additions Subtotals</b>		\$86,000	\$1,596,500	\$2,268,000	\$3,534,000	\$27,421,000	\$34,905,500
<b>MRP 1.0</b>		\$2,980,000	\$2,980,000	\$2,980,000	\$2,980,000	\$2,980,000	\$14,900,000
<b>Total MRP 2.0</b>		<b>\$3,066,000</b>	<b>\$4,576,500</b>	<b>\$5,248,000</b>	<b>\$6,514,000</b>	<b>\$30,401,000</b>	<b>\$49,805,500</b>

**Table 2 Detailed Support for Conservative Best Case Scenario: PCB Load Reduction (3.51 grams) with County GI Retrofit Projects**

<b>Provision Number</b>	<b>Requirement</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
C.12.a.i.	Implement PCB control measures	\$0	\$0	\$0	\$0	\$0
a.ii.1	Identify management areas with control measures	\$11,000	\$0	\$0	\$0	\$0
a.ii.2.	Identify current and new control measures (see C.12.a.ii.1)	\$0	\$0	\$0	\$0	\$0
a.ii.3.	Develop implementation schedule	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000
a.ii.4.	Implement Source Properties control measure	\$0	\$0	\$200,000	\$200,000	\$200,000
a.ii.4.	Implement North Richmon Pump Station control measure	\$0	\$0	\$0	\$0	\$0
a.ii.4.	Implement Street Sweeping control measure	\$0	\$0	\$0	\$0	\$0
a.ii.4.	Implement Green Infrastructure control measure	\$0	\$0	\$0	\$0	\$23,957,000
a.iii.1.	Progress report on control measures	\$5,000	\$0	\$0	\$0	\$0
a.iii.2.	Develop status for each Annual Report	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
a.iii.3.	Update on control measures, source properties, milestones (see C.12.a.iii.2)	\$0	\$0	\$0	\$0	\$0
a.iii.4.	Alternative load reduction distribution (optional) (see Note 1)					
b.i.	Develop load reduction assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.ii.	Calculate PCB load reduction each year	\$0	\$5,000	\$5,000	\$5,000	\$5,000
b.iii.1.	Submit assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.2.	Provide PCB load reductions each year (included in C.12.b.ii)	\$0	\$0	\$0	\$0	\$0
b.iii.3	Update assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.4	Alternative load reduction distribution (optional) (see Note 1)					
c.i.	Minimum GI projects for PCBs (see C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.1	Implement GI projects for specified reduction (included in C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.2.	Reasonable assurance analysis on GI projects (BASMAA)	\$0	\$0	\$0	\$0	\$2,000
c.iii.1.	Report on GI and PCB load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0
c.iii.2.	Report on land area treated by GI (BASMAA)	\$0	\$0	\$0	\$0	\$5,000



**Table 2 Detailed Support for Conservative Best Case Scenario: PCB Load Reduction (3.51 grams) with County GI Retrofit Projects**

<b>Provision Number</b>	<b>Requirement</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
c.iii.3.	Submit a reasonable assurance analysis (included in C.12.c.ii.2)	\$0	\$0	\$0	\$0	\$0
c.iii.4.	Report on PCBs removed with GI	\$0	\$0	\$0	\$2,000	\$2,000
d.i.	Implementation plan for TMDL waste-load allocations (see C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
d.ii.1.	Identify control measures	\$0	\$0	\$0	\$0	\$15,000
d.ii.2.	Implement control measures	\$0	\$0	\$0	\$0	\$5,000
d.ii.3.	Evaluate effectiveness of control measures	\$0	\$0	\$0	\$0	\$16,000
d.iii.	Submit implementation plan (included in C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
e.i.-iii.	Evaluate PCBs in public infrastructure facilities (BASMAA)	\$0	\$0	\$2,000	\$0	0
C.12.f.i.	Manage demolition debris to contain PCBs (see C.12.f.ii.1)	\$0	\$0	\$0	\$0	\$0
f.ii.1.	Develop debris management protocols	\$0	\$0	\$0	\$45,000	\$0
f.ii.2.	Implement debris management protocols	\$0	\$0	\$0	\$5,000	\$0
f.ii.3.	Assessment of debris management effectiveness (BASMAA)	\$0	\$0	\$0	\$0	\$0
f.iii.1.	Report on implementing debris management	\$2,000	\$2,000	\$2,000	\$0	\$0
f.iii.2.	Prepare exemption justification (not applicable)					
f.iii.3.	Report on debris management protocols	\$0	\$0	\$0	\$0	\$2,000
f.iii.4.	Report on applicable buildings	\$0	\$0	\$0	\$0	\$11,000
f.iii.5.	Assessment methodology for load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0
g.i.-iii.	Fate and transport study (SFEI)	\$0	\$0	\$0	\$0	\$0
h.i.-iii.	Risk reduction program (included in MRP 1.0)	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Costs</b>		<b>\$31,000</b>	<b>\$11,000</b>	<b>\$213,000</b>	<b>\$261,000</b>	<b>\$24,224,000</b>

**Note:**

1. The current distribution method of load reduction within the county is based on the proportional population of each co-permittee. If the Clean Water Program decided to develop an alternative distribution methodology, the estimated cost

## Exhibit 1

# MRP 2.0 Compliance Costs for Unincorporated Contra Costa County

### 1. MRP 2.0 requirements for unincorporated Contra Costa County

- Reduce trash 70% by 2017 and 80% by 2019.
- Achieve 28.48 grams PCB load reduction by 2020 (County's 15.26% share of 560 grams countywide, plus 67% credit for debris management program).
- Achieve at least 3.51 grams PCB load reduction through Green Infrastructure by 2020 (23 grams countywide).
- Achieve at least 1.37 grams Mercury load reduction through Green Infrastructure by 2020 (9 grams countywide).

### 2. Assumptions

- Mercury reduction requirements are met with PCB load reduction control measures.
- County will adopt a PCB demolition management program and receive 67% credit.
- Old Urban/Industrial land uses are pre-1980 development shown on ABAG maps.

### 3. MRP 2.0 compliance costs for unincorporated Contra Costa County

- **Worst Case Scenario:** Total five-year permit cost is \$200,000,000
  - o 1.5 grams PCBs from development (10 acres Old Industrial/Urban per year)
  - o 1.0 grams PCBs from source properties (net load reduction after 50% credit)
  - o 1.0 grams PCBs from street sweeping in Old Industrial areas
  - o 0.14 grams PCBs diverting stormwater at the North Richmond Pump Station
  - o 24.84 grams PCB load reduction with public retrofit GI projects:
    - Treating 615 acres Old Urban/Old Industrial land use mix
    - \$215,000 Green Infrastructure cost per treated acre
    - 70% efficiency factor for Green Infrastructure
  - o PCB control measures represent 92% of total costs
- **Optimal Best Case Scenario:** Total five-year permit cost is \$25,800,000
  - o 24.97 grams PCB load reduction met with source property referrals
  - o 3.51 grams PCB load reduction met with private development
- **Conservative Best Case Scenario:** Total five-year permit cost is \$49,800,000
  - o 24.97 grams (87.7%) PCB load met with source properties or private development
  - o 3.51 grams (12.3%) PCB load met with public GI retrofit projects (\$24,000,000)
    - Treating 78 acres Old Urban/Old Industrial land use mix
    - \$215,000 Green Infrastructure cost per treated acre with 70% efficiency

**Table 3: Countywide PCB Load Reduction Estimates  
From Source Properties**

Source Property Location	Acreage	PCB Yield Factor Grams/Acre/Year	Total Grams	PCB Load Reduction by Reporting Year (grams)	
				2018	2020
Antioch	18.5	3.978	73.6	37	0
County (Fass-Gertrude)	0.5	3.978	1.99	1	0
Pittsburg (Molino)	6.0	3.978	23.87	12	0
Richmond (Simms)	14.0	3.978	55.7	28	0
Richmond (Rickert)	0.5	3.978	1.99	1	0
San Pablo (Rumrill)	4.0	3.978	15.91	8	0
<b>Totals</b>	<b>43.5</b>		<b>173.06</b>	<b>87</b>	<b>87</b>
<b>Load Reduction Requirement</b>				<b>90</b>	<b>186.7</b>
<b>Load Reduction Needed</b>				<b>3</b>	<b>100</b>

**Notes:**

1. All Source Properties are located in Old Industrial areas, so the yield factor is calculated as the Source Property yield (4.065 grams/acre/year) minus the Old Industrial land use yield (.0865 grams/acre/year).
2. Half credit given in 2018, half credit upon completion. Remediation projects are assumed to take longer than remainder of permit term, so only 50% credit shown for this permit term (all in 2018).
3. The 2020 PCB load reduction requirement is 560 grams per year, but this is reduced 67% to 186.7 grams per year if all co-permittees implement a PCB Demolition Debris Management



**Table 4. Green Infrastructure Built by Development Projects**

**I. Summary of Total PCBs Treated by Development for Each Year**

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total PCBs (mg)	84.2	553.7	44.8	0	133	176.9	222.9	174.9	144.2

**II. PCB Treatment Calculations for Each Development Project**

Development Project Name	Location	Land Use Type	Treated/ Project Acres	GI Type	Year Installed	Efficiency Factor	PCB (mg)
Byron Jet Center (CCC)	Byron				2005		
Caballo Ranchero (MS 06-026)	Diablo	Old Urban	2.10		2008		44.5
Paulson Lane (SD 8939)	Walnut Creek	Old Urban	1.76	Bio filter	2008	.7	37.3
Stone Throw Farm (ZI 11861)	San Ramon	Open Space	.55	Self Treat	2008	1.0	2.4
Station Landing (DP 07-3064)	Pleasant Hill	Old Urban	4.57		2009		96.9
Central Concrete (ZI 07-12120)	Martinez	Open Space	3.8	Bio filter	2009	.7	11.4
Vasco Road Improvements (CCC)	Byron	Open Space	21	Bio filter	2009	.7	445.4
Shakespeare Festival (LP 08-2050)	Orinda	Open Space	4.83	Bio filter	2010	.7	14.5

**Table 4. Green Infrastructure Built by Development Projects**

Development Project Name	Location	Land Use Type	Treated/ Project Acres	GI Type	Year Installed	Efficiency Factor	PCB (mg)
Wallgreens (LP 08-2044)	Bay Point	Old Urban	1.43	Bio filter	2010	.7	30.3
Belmont Terrace (SD 8984)	Martinez	Old Urban (3.1)/Open Space (10.4)	13.49	Bio filter	2012	.7	97.0
El Rincon (SD 07-9189)	Bay Point	Old Urban	1.53	Bio filter	2012	.7	32.4
Print Plant (LP 10-2078)	Concord	New Urban	.88		2012		2.2
Jack-n-Box (ZI 09-12638)	Bay Point	New Urban	.56	Bio filter	2012	.7	1.4
Livorna Heights (MS 07-0017)	Alamo	Old Urban	0.24	Bio filter	2013	.7	5.1
South Avenue (MS 06-0013)	Alamo	Old Urban	1.08	Bio filter	2013	.7	22.9
Los Vaqueros (LP 11-2011)	Byron	Open Space	3.27	Bio filter	2013	.7	9.8
Sikh Center (LP 03-2052)	El Sobrante	Old Urban	2.64	Bio filter	2013	.7	56.0
Martinez Wellness Center (CCC)	Martinez	Old Urban	.46	Bio filter	2013	.7	9.8
Regional Med Ctr Parking Lot E (CCC)	Martinez	Old Urban	0.7	Bio filter	2013	.7	14.8
West County Health Ctr (CCC)	San Pablo	Old Urban	2.76	Bio filter	2013	.7	58.5

**Table 4. Green Infrastructure Built by Development Projects**

Development Project Name	Location	Land Use Type	Treated/ Project Acres	GI Type	Year Installed	Efficiency Factor	PCB (mg)
Arbor View (SD 07-9174)	Reliez Valley	Open Space	5.95	Bio filter	2014	.7	17.9
Tower Mart 101 (CV 13-0066)	Bay Point	Old Urban	.59	Bio filter	2014	.7	12.5
1251 Laverock (MS 07-0015)	Alamo	Old Urban	.94	Bio filter	2014	.7	19.9
Sam's Club (DP 11-3018)	Concord	Old Urban	8.14		2014		172.6
Laurel Place (SD 05-8769)	Concord	Old Urban	3.8	Bio filter	2015	.7	80.6
Hemme Estates (MS 14-0004)	Alamo	Old Urban	1.33	Bio filter	2015	.7	28.2
Westborough (SD 14-9376)	Walnut Creek	Old Urban	1.20	Bio filter	2015	.7	25.5
1210 Livorna Road (MS 06-0038)	Alamo	Old Urban	.74	Bio filter	2015	.7	15.7
1202 Mtn View Blvd (MS 14-0006)	Walnut Creek	Old Urban	.84		2015		17.8
2510 D. Leshner Dr. (LP 07-2045)	Concord	New Urban	2.92	Bio filter	2015	.7	7.1
Sufi Reoriented (LP 08-2034)	Saranap	Old Urban	1.03	Bio filter	2016	.7	21.8
San Ramon Vly Church (LP 12-2110)	Alamo	Old Urban	.46	Bio filter	2016	.7	9.8

**Table 4. Green Infrastructure Built by Development Projects**

Development Project Name	Location	Land Use Type	Treated/ Project Acres	GI Type	Year Installed	Efficiency Factor	PCB (mg)
66 Crest Avenue (MS 14-0013)	Alamo	Old Urban	1.97		2016		41.8
3600 Byers Road (MS 15-0005)	Byron	Open Space	.28	Irrigation Pond	2016	1.0	0.8
Mtn View Landing (DP 07-3029)	Vine Hill	Open Space	1.59	Bio filter	2016	.7	4.8
Queen of Heaven (LP 09-2036)	Reliez Valley	Open Space	1.98	Bio filter	2016	.7	6.0
Ashford Place (SD 05-8967)	Pacheco	Open Space	9.30	Bio filter	2016	.7	28.0
Alhambra Vly Road (SD 8634)	Alhambra Valley	Open Space	10.37	Bio filter	2016	.7	31.2

**Notes:**

1. The PCB load reduction is calculated by multiplying the yield factor for the appropriate land use type (86.5 mg PCB/acre/year for Old Industrial, 30.3 mg PCB/acre/year for Old Urban, 3.5 mg PCB/acre/year for New Urban, and 4.3 mg PCB/acre/year for Open Space) with the project/treated acreage.
2. All areas, either treated or self-treated, within the general project area were included in the treated acreage. Areas of the property obviously outside the project area were not considered in the treated acreage.
3. All projects are private development projects except those denoted (CCC), which are County projects.

**Table 5. Unincorporated Contra Costa County PCB Control Measures**

**Comparative Costs**

Number	Control Measure	Description	Implementation Cost per gram	Annual Ongoing Cost per gram
1	North Richmond Pump Station	Connect to WCWD plant and divert stormwater for a maximum 0.14 grams/year. (Note 1)	\$840,000	\$2,200,000
2A	Green Infrastructure Old Industrial	Install Green Infrastructure on public land, with \$215,000 per treated acre and 70% efficiency. (Note 2)	\$3,500,000	\$50,000
2B	Green Infrastructure Old Urban	Install Green Infrastructure on public land, with \$215,000 per treated acre and 70% efficiency. (Note 2)	\$10,100,000	\$141,000
2C	Green Infrastructure New Urban	Install Green Infrastructure on public land, with \$215,000 per treated acre and 70% efficiency. (Note 2)	\$87,800,000	\$1,220,000
3A	Enhanced Street Sweeping Old Industrial	Assume curb and gutter installed on 200 foot long city blocks and treated area is block interior (40,000 SF). Assumes no drainage work required! (Note 3)	\$910,000	\$50,000
3B	Enhanced Street Sweeping Old Urban	Assume curb and gutter installed on 200 foot long city blocks and treated area is block interior (40,000 SF). Assumes no drainage work required! (Note 3)	\$2,600,000	\$50,000
4A	Identify Local Source Properties	Assume 1.0 grams average net load reduction with each source property identified in County. (Note 4)	\$7,000	\$25,000
4B	Identify Regional Source Properties	Work with agencies with "mega" source properties in the Bay Area to develop regional referrals. (Note 5)	Unknown	Unknown
5	Identify all Development Treatment	Identify all projects on private property that remediates or treats PCBs, through a variety of permit types, to maximize credit potential.	Low (requires administrative diligence)	Very Low (Maintenance of tracking processes)



**Table 5. Unincorporated Contra Costa County PCB Control Measures**

**Comparative Costs**

6	Review Prior Development	Identify all development projects since 2009 to receive maximum credit for PCBs. Assume 1.0 grams PCBs yield.	\$10,000	None (one time administrative project)
7	County Building Projects	Include treatment of PCBs in Capital Projects. Assume investment in Old Industrial areas. (Note 2)	\$3,500,000	\$50,000
8	County Infrastructure Projects	Include treatment of PCBs in Infrastructure Projects. Assume investment in Old Industrial areas. (Note 2)	\$3,500,000	\$50,000

**Notes:**

1. The Annual Ongoing Cost is based on the standard rate for treating influent at the wastewater treatment plant. This ongoing cost could be substantially reduced if the diverted stormwater was considered a resource as part of a re-use project.
2. Annual maintenance costs for green infrastructure is assumed to be \$3,000 per treated acre (about \$2 per square foot - based on CCCPWD bio-retention project).
3. The estimated cost to install curb, gutter, and pavement widening is \$90 per lineal foot. The ongoing annual cost represents the additional street sweeping cost.
4. Cost estimate based on a similar project in Santa Clara County for the Leo Street neighborhood, and assume 50 grams.
5. It's unknown what the potential load reduction could be or what the costs would be to implement this control measure.

**Table 6. Additional MRP 2.0 PCB Control Measures to meet 2018/2020 Load Reduction Requirements**

Tier (1)	MRP 2.0 Control Measure	Recommendation	Estimated Cost FY 2017/18	Estimated PCB grams	Pros	Cons
1A	Install Green Infrastructure (Note 2)	Install a \$300,000 Green Infrastructure project on County owned parcel in Old Industrial area.	\$50,000 (Planning for \$300,000 project in 2020)	.08 grams (when project complete in 2020)	Learn process to develop a GI project and reduce unit costs	Expensive PCB per gram cost
1B	Identify all Development Treatment	Establish processes to identify and track all types of projects that treat or remediate PCBs.	\$50,000 (staff costs)	Unknown, depends on project types and timing, but perhaps 1.0 grams	Very low cost per PCB gram	Difficult to determine PCB load reduction
1C	Review Prior Development	Review all prior development approved since 2009 to receive maximum credit.	\$10,000 (staff time)	Unknown, depends on development, but likely in the range of 1.0 grams	Easy and inexpensive method for PCB credits	No guarantee any will be found
1D	Identify Local Source Properties	Work with the Clean Water Program to contract with a consultant to identify source properties within the County.	\$25,000 (County share)	Unknown, hopefully 50 grams	- Low cost per PCB gram - Most effective action to improve environment	Requires cooperation of all municipalities in County
1E	PCB Treatment on County Building Projects	Include treatment of PCBs in County capital building projects	Assume \$250,000 investment per project in Old Industrial area (Note 2)	0.07	- County controls project processes - Demonstrates commitment	Expensive PCB per gram cost
1F	PCB Treatment on Infrastructure Projects	Include treatment of PCBs in County road and other infrastructure projects	Assume \$250,000 investment per project in Old Industrial area (Note 2)	0.07	- County controls project processes - Demonstrates commitment	Expensive PCB per gram cost
2A	Identify Regional Source Properties	Work with the Clean Water Program and BASMAA to negotiate between Bay Area permittees and jurisdictions with "mega" source properties to share costs and credits.	\$5,000 (County share of \$35,000 effort, see Note 3)	25 (assumes this meets all PCB requirements except minimum required with Green Infrastructure)	- Low cost per PCB gram - Most effective action to improve environment	Requires cooperation of multiple agencies in Bay Area



Tier (1)	MRP 2.0 Control Measure	Recommendation	Estimated Cost FY 2017/18	Estimated PCB grams	Pros	Cons
2B	Enhanced Street Sweeping	Scope out a project to install curb and gutter around one block of an Old Industrial area, determine construction costs, annual ongoing costs, and benefits, and report back on a recommendation.	\$50,000 (staff costs)	Potential amount to be determined	Provides information to make informed decision on this type of control measure	No guarantee scoping cost will result in a good project
2C	North Richmond Pump Station	Work with WCWD to see if there is support for a re-use project and participate if funding is available for implementation and operations.	\$20,000 (staff time)	.14 grams	Multi-benefit project furthers re-use development	Low return on investment
2D	Research PG&E Spills	Work with the Clean Water Program to review State records to determine where PCB spills occurred in Contra Costa County.	\$5,000 (County share of consultant)	Unknown	Easy and inexpensive method for PCB credits	No guarantee any PCBs will be found
2E	Request PG&E for Spill Data	Work with the Clean Water Program to prepare and submit a public records request to PG&E to disclose all spills that have occurred in Contra Costa County.	\$5,000 (County share of consultant)	Unknown	Easy and inexpensive method for PCB credits	No guarantee any PCBs will be found

**Notes:**

1. Tier 1 control measures are recommended to be initiated in 2017, while Tier 2 control measures are recommended to be revisited in 2018 for further evaluation.
2. Estimated PCB grams based on \$215,000 per treated acre and 70% efficiency factor.
3. Even though this is a Tier 2 recommendation, it is recommended to budget \$5,000 for FY 2017-18 for staff time to explore and better define this control measure.

**Table 7. Unincorporated Contra Costa County Trash Control Measures**

Comparative Costs						
No.	Control Measure	Description	Implementation Cost	Percent Reduction (Note 11)	Implementation Cost per 1%	Annual Ongoing Cost
1	Full Trash Capture Devices (FTCD): Very High	Install full trash capture devices on all drainage inlets in Very High trash generation areas (62 inlets, Note 1).	\$86,000	15	\$5,400	\$112,000
2	Full Trash Capture Devices (FTCD): High	Install full trash capture devices on all drainage inlets in High trash generation areas (689 inlets, Note 1).	\$965,000	53	\$18,000	\$1,240,000
3	Full Trash Capture Devices (FTCD): Moderate	Install full trash capture devices on all drainage inlets in Moderate trash generation areas (993 inlets, see Note 1).	\$1,389,000	20	\$45,000	\$1,790,000
4	On-Land Clean Up	Increase trash pickup in current service area and expand pickup into additional areas. (Note 7)	\$500,000	37	\$13,500	\$35,000
5	Adopt-A-Spot	Implement an Adopt-a-Spot program (similar to the Adopt-a-Road program) that will enlist vollunteers to improve trash reduction in target areas. (Note 12)	\$25,000	1	\$25,000	\$10,000
6	Ban Polystyrene Food Containers	Develop a ban on PolyStyrene food containers.	\$75,000	4	\$18,700	\$20,000
7	Ban on Plastic Bags	Enforce ban on plastic bags.	\$25,000	6	\$4,200	\$10,000
8	Direct Trash Discharge Control (DTDC) Plan	Cleanup homeless encampments and prevent illegal dumping in creeks. Costs for 2017 and 2018 only. (Notes 2 & 4)	\$300,000	15	\$20,000	\$260,000

Table 7. Trash Comparative Costs 4-10-17



**Table 7. Unincorporated Contra Costa County Trash Control Measures**

**Comparative Costs**

No.	Control Measure	Description	Implementation Cost	Percent Reduction (Note 11)	Implementation Cost per 1%	Annual Ongoing Cost
9	Creek Cleanups	Implement a program using volunteers and County labor to remove trash twice a year from creeks. Assume 125 cubic yards removed (Notes 2 & 5)	\$150,000	10	\$15,000	\$150,000
10	Dynamic Trash Separator (FTCD): High	Install hydro-dynamic separator in the 340 acre North Richmond Pump Station Drainage system. (Note 9)	\$1,000,000	8	\$125,000	\$20,000
11	Street Sweeping	Regular sweeping of streets with curb and gutter to pick up trash. (Note 6)	\$125,000	11	\$11,000	\$125,000
12	Illegal Dumping	Pick up items illegally dumped on County property and rights of way. (Note 10)	\$650,000	0	N/A	N/A
13	100% Full Trash Capture Devices (FTCD)	Install full trash capture devices on all drainage inlets in Very High, High, and Moderate trash generation areas: 1744 - 139 installed = 1605 inlets. (Notes 1 and 8)	\$3,690,000	89	\$41,500	\$2,900,000
14	Community Based Education and Outreach Program	Develop trash reduction education and outreach programs specific to interested communities. (Note 12)	\$50,000	1	\$50,000	\$50,000
15	Commercial street sweeping	Increased frequency of street sweeping in commercial areas.	\$50,000	5	\$10,000	\$50,000
16	Patrol Trash Areas	Hire Deputy Sheriff to patrol creek channels and road areas to prevent homeless encampments and illegal dumping.	\$260,000	0 (Note 3)	(Note 3)	\$260,000



**Table 7. Unincorporated Contra Costa County Trash Control Measures**

**Comparative Costs**

No.	Control Measure	Description	Implementation Cost	Percent Reduction (Note 11)	Implementation Cost per 1%	Annual Ongoing Cost
18	Mandatory Trash Service	Ensure every occupied residential and commercial property has trash service.	\$160,000	3 - 7	\$23,000 - \$53,000	\$25,000
19	Enforce Restaurant Buffers	Ensure restaurants maintain their 400 feet buffer areas free of trash.	\$25,000		Unknown	\$25,000
20	Effective Street Sweeping	Install No Parking signs with street sweeping schedule and enforce no parking during sweeping times.	Unknown		Unknown	

**Notes:**

1. Complete cost per inlet conversion is \$1,000 including planning, construction, and inspection. Assume 10% of inlets need structural modifications and cost \$5,000 per conversion. Annual maintenance costs per inlet is \$1,800 (\$600 three times per year).
2. Trash load requirements are increased by a factor of 3 after 2018 (from 12.4 cubic yards for 1% load reduction to 37.6 cubic yards) to maintain maximum credit of 10% for creek cleanups and 15% for homeless cleanups.
3. There is no direct trash load reduction with hiring a Deputy Sheriff to patrol creeks and roads, but if part of a comprehensive homeless and illegal dumping program (DTDC Plan) it could result in a reduction of trash in creeks.
4. A 1% trash load reduction (offset) is allowed with removal of 12.4 cubic yards of trash from homeless encampments and illegal dumping up to a maximum of 15%. The County must have a Direct Trash Discharge Control Plan approved by the Regional Board to be eligible for this reduction.
5. A 1% trash load reduction offset is allowed with removal of 12.4 cubic yards of trash from creeks and shorelines (outside of the DTDC Plan) up to a maximum of 10%. The County must perform the clean-ups twice a year and demonstrate a sustained environmental improvement.
6. The Regional Board considers full trash capture devices to be 100% effective and load reduction in any trash generation area goes automatically to Low, or fully compliant. However, the Regional Board does not consider other control measures that physically pick up trash to be 100% effective. For planning purposes it is assumed an investment in a control measure will result in the area dropping down to the next trash generation level so, for example, a Very High trash generation area will drop to a High trash generation area.
7. Implementation cost based on current contract, and percent reduction based on visual assessments.
8. Installing 100% FTCD does not result in 100% load reduction because not all trash generation areas drain to a drainage inlet. Percent reduction calculation assumes each inlet treats 2 acres.
9. Improvement costs in this watershed are split 61% County and 39% City of Richmond, based upon the jurisdictional tributary area to the North Richmond Pump Station. In this case, the implementation cost is for the whole project, but the estimated percent reduction and unit cost is based upon the County's portion only.



**Table 7. Unincorporated Contra Costa County Trash Control Measures**

**Comparative Costs**

- 10. The County expends significant resources picking up illegal dumping along County roads in upland areas, however there is no credit for removing this trash from the landscape. Credit for illegal dumping is only allowed when it is removed along creeks, which is included in the Direct Trash Discharge Control Plan.
- 11. "Percent Reduction" represents the theoretical load reduction and does not take into account other factors that may influence the load, such as for example, other control measures in the same area (e.g. street sweeping).
- 12. A 1.0% load reduction is assumed by implementing this control measure.

**Table 8. Additional MRP 2.0 Trash Control Measures to Meet Required 2017/2019 Load Reduction**

Tier (1)	MRP 2.0 Control Measure	Recommendation	Estimated			Pros	Cons
			Cost (FY 2017/18)	Load Reduction (%)			
1A	Install Full Trash Capture Devices	Install approximately 154 Full Trash Capture Devices in Very High and High trash generation areas.	\$300,000	7 (14) (Note 2)		Quick process to meet 2017 deadline	Less cost effective than dynamic separators
1B	On-Land Clean Up	Increase trash pickup in current service areas and expand pickup into additional areas.	\$200,000	10 (assumed to achieve 10% above existing)		Quick process to meet 2017 deadline	Requires visual assessment monitoring
1C	Adopt-a-Spot	Implement an Adopt-a-Spot program (similar to the Adopt-a-Road program) that will enlist volunteers to improve trash reduction in target areas.	\$25,000 (staff cost)	1 (assumed to achieve 1% above existing)		Adds value to community	More difficult to maintain program than other control measures
1D	Enforce Ban on Plastic Bags.	Enforce ban on plastic bags in unincorporated communities.	\$25,000	6		Fairly easy to implement	Requires ongoing monitoring
1E	Direct Trash Discharge Control Plan	Clean up homeless encampments and prevent illegal dumping in creeks. (costs for 2017 and 2018)	\$300,000	15		Cost effective measure with significant load reduction	Stop gap measure. Allowable credit reduced in 2019
1F	Creek Cleanups	Remove trash from creeks twice a year using volunteers and County labor. (costs for 2017 and 2018)	\$30,000	Up to 10		Cost effective measure using volunteer labor	Stop gap measure. Allowable credit reduced in 2019
2A	Ban Polystyrene Food Containers	Develop a ban on polystyrene food containers in unincorporated communities. (Note 3)	\$75,000	4		Fairly easy to implement	Difficult to implement in time for 2017 deadline
2B	Dynamic Trash Separator	Install a hydrodynamic separator in the North Richmond Pump Station drainage system. (Note 4)	\$1,000,000	8		More long term cost effective measure than FTCD	More complex project requires two years to implement
2C	Street Sweeping	Sweep additional streets with curb and gutter to pick up trash.	\$125,000	Unknown		Quick process to meet 2017 deadline	Requires visual assessment monitoring



Tier (1)	MRP 2.0 Control Measure	Recommendation	Estimated Cost (FY 2017/18)	Estimated Load Reduction (%)	Pros	Cons
2D	70% Full Trash Capture Devices	Install full trash capture devices on all drainage inlets in Very High (62 inlets), High (689), and Moderate (31) trash generation areas.	\$1,100,000	70	Meets the 2017 load reduction requirement	Not a cost effective control measure
2E	Right Size-Right Service	Ensure trash customers have the right size container for the trash they generate.	\$150,000	5 - 10	Effective measure, eliminates trash at source	Complex program with multiple service providers
2F	Mandatory Trash Service	Ensure every occupied residential and commercial property has trash service.	\$160,000	5 - 10	Effective measure, captures trash at source	Complex program with multiple service providers
2G	Enforce Restaurant Buffers	Ensure restaurants maintain their 400 buffer areas free of trash.	\$25,000	Unknown	Fairly easy to implement	Not all restaurants have buffer areas
2H	Effective Street Sweeping	Install No Parking signs with street sweeping schedule and enforce no parking during sweeping times.	Unknown	Unknown	Improves investment in street sweeping	Unpopular measure, difficult to implement

#### Notes:

1. Tier 1 Control Measures are recommended to be initiated in 2017, while Tier 2 control measures are recommended to be revisited in 2018 for further evaluation.
2. The theoretical load reduction is 14% based on no prior trash control measures performed within the treated area, however, some trash control measures have occurred in the treated area and partial credit taken in prior reporting years. So, the actual load reduction is estimated at 7%, less than the theoretical load reduction.
3. Although this is a Tier 2 recommendation and will not help to achieve the 70% trash reduction by June 2017, it is recommended to budget \$75,000 for FY 2017-18 to establish the program so credit can be received in the 2018 reporting period.
4. Improvement costs in this watershed are split 61% County and 39% City of Richmond, based upon the jurisdictional tributary area to the North Richmond Pump Station. The estimated load reduction is based upon the County's portion only.

**Table 9. MRP 2.0 Cost Compliance  
Most Likely Scenario**

Provision No.	MRP 2.0 Additional Requirements	Estimated Expenditures					Totals
		2016	2017	2018	2019	2020	
C.3	Green Infrastructure	\$0	\$91,500	\$41,000	\$889,000	\$43,000	\$1,064,500
C.10	Trash	\$55,000	\$1,494,000	\$2,014,000	\$2,384,000	\$3,154,000	\$9,101,000
C.11 and C.12	Mercury and PCB	\$31,000	\$11,000	\$213,000	\$361,000	\$43,367,000	\$43,983,000
<b>Additions Subtotals</b>		\$86,000	\$1,596,500	\$2,268,000	\$3,634,000	\$46,564,000	\$54,148,500
<b>MRP 1.0</b>		\$2,980,000	\$2,980,000	\$2,980,000	\$2,980,000	\$2,980,000	\$14,900,000
<b>Total MRP 2.0</b>		<b>\$3,066,000</b>	<b>\$4,576,500</b>	<b>\$5,248,000</b>	<b>\$6,614,000</b>	<b>\$49,544,000</b>	<b>\$69,048,500</b>



**Table 9. Detailed Support for Most Likely Scenario**

Provision Number	Requirement	2016	2017	2018	2019	2020
C.12.a.i.	Implement PCB control measures	\$0	\$0	\$0	\$0	\$0
a.ii.1	Identify management areas with control measures	\$11,000	\$0	\$0	\$0	\$0
a.ii.2.	Identify current and new control measures (see C.12.a.ii.1)	\$0	\$0	\$0	\$0	\$0
a.ii.3.	Develop implementation schedule	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000
a.ii.4.	Implement Source Properties control measure	\$0	\$0	\$200,000	\$300,000	\$300,000
a.ii.4.	Implement North Richmon Pump Station control measure	\$0	\$0	\$0	\$0	
a.ii.4.	Implement Street Sweeping control measure	\$0	\$0	\$0	\$0	\$0
a.ii.4.	Implement Green Infrastructure control measure	\$0	\$0	\$0	\$0	\$43,000,000
a.iii.1.	Progress report on control measures	\$5,000	\$0	\$0	\$0	\$0
a.iii.2.	Develop status for each Annual Report	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
a.iii.3.	Update on control measures, source properties, milestones (see C.12.a.iii.2)	\$0	\$0	\$0	\$0	\$0
a.iii.4.	Alternative load reduction distribution (optional) (see Note 1)					
b.i.	Develop load reduction assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.ii.	Calculate PCB load reduction each year	\$0	\$5,000	\$5,000	\$5,000	\$5,000
b.iii.1.	Submit assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.2.	Provide PCB load reductions each year (included in C.12.b.ii)	\$0	\$0	\$0	\$0	\$0
b.iii.3	Update assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.4	Alternative load reduction distribution (optional) (see Note 1)					
c.i.	Minimum GI projects for PCBs (see C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.1	Implement GI projects for specified reduction (included in C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.2.	Reasonable assurance analysis on GI projects (BASMAA)	\$0	\$0	\$0	\$0	\$2,000
c.iii.1.	Report on GI and PCB load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0



**Table 9. Detailed Support for Most Likely Scenario**

Provision Number	Requirement	2016	2017	2018	2019	2020
c.iii.2.	Report on land area treated by GI (BASMAA)	\$0	\$0	\$0	\$0	\$5,000
c.iii.3.	Submit a reasonable assurance analysis (included in C.12.c.ii.2)	\$0	\$0	\$0	\$0	\$0
c.iii.4.	Report on PCBs removed with GI	\$0	\$0	\$0	\$2,000	\$2,000
d.i.	Implementation plan for TMDL waste-load allocations (see C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
d.ii.1.	Identify control measures	\$0	\$0	\$0	\$0	\$15,000
d.ii.2.	Implement control measures	\$0	\$0	\$0	\$0	\$5,000
d.ii.3.	Evaluate effectiveness of control measures	\$0	\$0	\$0	\$0	\$16,000
d.iii.	Submit implementation plan (included in C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
e.i.-iii.	Evaluate PCBs in public infrastructure facilities (BASMAA)	\$0	\$0	\$2,000	\$0	0
C.12.f.i.	Manage demolition debris to contain PCBs (see C.12.f.ii.1)	\$0	\$0	\$0	\$0	\$0
f.ii.1.	Develop debris management protocols	\$0	\$0	\$0	\$45,000	\$0
f.ii.2.	Implement debris management protocols	\$0	\$0	\$0	\$5,000	\$0
f.ii.3.	Assessment of debris management effectiveness (BASMAA)	\$0	\$0	\$0	\$0	\$0
f.iii.1.	Report on implementing debris management	\$2,000	\$2,000	\$2,000	\$0	\$0
f.iii.2.	Prepare exemption justification (not applicable)					
f.iii.3.	Report on debris management protocols	\$0	\$0	\$0	\$0	\$2,000
f.iii.4.	Report on applicable buildings	\$0	\$0	\$0	\$0	\$11,000
f.iii.5.	Assessment methodology for load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0
g.i.-iii.	Fate and transport study (SFEI)	\$0	\$0	\$0	\$0	\$0
h.i.-iii.	Risk reduction program (included in MRP 1.0)	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Costs</b>		<b>\$31,000</b>	<b>\$11,000</b>	<b>\$213,000</b>	<b>\$361,000</b>	<b>\$43,367,000</b>

**Note:**

1. The current distribution method of load reduction within the county is based on the proportional population of each co-permittee. If the Clean Water Program decided to develop an alternative distribution methodology, the estimated cost would be \$25,000.

**Table 10. MRP 2.0 Implementation Budget: Resource Based (Constrained)**

MRP Provision	Description	MRP 1.0 2017-2018	MRP 2.0 Additional Provisions	MRP 2.0 2017-18 Budget	Funding Source for 2017-18 Budget		
					SUA 17	Road Fund	Other Depts General Fund
C2	Municipal Operations	\$32,000		\$32,000		\$32,000	
C2	Street Sweeping	\$200,000	\$125,000	\$325,000	\$125,000		\$200,000
C3	Development/LID	\$123,000		\$123,000	\$123,000		
C3.j	Green Infrastructure Planning		\$92,000	\$92,000			
C4	Industrial/ Commercial Site Controls	\$225,000					
C5	Illicit Discharges	\$143,000		\$225,000	\$25,000		\$200,000
C6	Construction Controls	\$8,000		\$143,000	\$23,000		\$120,000
C7	Public Outreach	\$210,000		\$8,000			
C8	Monitoring	\$30,000		\$210,000	\$210,000		
C9	Pesticide Controls	\$25,000		\$30,000	\$30,000		
C10	Trash (Note 1)	\$456,000	\$69,000	\$25,000	\$25,000		
C10	Trash capture devices (Note 2)		\$577,000	\$525,000	\$525,000		
C10	Trash seperator planning			\$577,000	\$300,000	\$277,000	
C10	On-land clean up	\$540,000	\$100,000	\$100,000	\$100,000		
C10	Adopt-a-Spot		\$200,000	\$740,000	\$740,000		
C10	Plastic bag ban program		\$25,000	\$25,000	\$25,000		
C10	Polystyrene ban		\$25,000	\$25,000			\$25,000
C10	Direct discharge controls (Note 6)	\$100,000	\$75,000	\$75,000	\$75,000		
C10			\$200,000	\$300,000	\$150,000	\$75,000	\$25,000



MRP Provision	Description	MRP 1.0 2017-2018	MRP 2.0 Additional Provisions	MRP 2.0 2017-18 Budget	Funding Source for 2017-18 Budget			
					SUA 17	Road Fund	Other Depts	General Fund
C10	Creek clean-ups (Note 7)	\$120,000	\$30,000	\$150,000	\$75,000		\$65,000	\$10,000
C11	Mercury Controls	\$15,000		\$15,000	\$15,000			
C12	PCB Controls (Note 3)	\$40,000	\$11,000	\$51,000	\$51,000			
C12	PCB/GI project		\$50,000	\$50,000	\$50,000			
C12	Identify development treatment		\$60,000	\$60,000	\$60,000			
C12	Local Source Properties		\$25,000	\$25,000	\$25,000			
C12	Regional Source Properties		\$5,000	\$5,000	\$5,000			
C12	County CIP Project (Note 4)		\$500,000	\$500,000		\$250,000		\$250,000
C15	Annual Report	\$70,000	\$20,000	\$90,000	\$90,000			
	RWQCB Fees	\$45,000		\$45,000	\$45,000			
	BIMID Cost Share	\$30,000		\$30,000	\$15,000	\$15,000		
	Drainage Inventory	\$50,000		\$50,000		\$50,000		
	Marina Program	\$10,000		\$10,000	\$10,000			
	Program Admin. (Note 8)	\$230,000		\$230,000	\$230,000			
	Knightesen Biofilter (Note 5)	\$10,000		\$10,000			\$10,000	
<b>Totals</b>		<b>\$2,712,000</b>	<b>\$2,189,000</b>	<b>\$4,901,000</b>	<b>\$3,247,000</b>	<b>\$699,000</b>	<b>\$470,000</b>	<b>\$485,000</b>

#### Notes

1. Trash budget for MRP 1.0 represents projected costs from the past two years; the budget amount for MRP 2.0 Additional Provisions represents several small-scale planning activities such as maintenance plans, reports, and certifications.
2. The budget for full trash capture devices on drainage inlets includes \$300,000 for installation and \$277,000 for the first year of maintenance.



3. The PCB budget for MRP 1.0 is projected costs from the past two years; the budget amount for MRP 2.0 Additional Provisions is several small scale planning activities such as reports, schedules, and evaluations.
4. County Capital Improvement Program (CIP) projects are divided into two types: one is infrastructure projects like roads and bridges paid for from the Road Fund, and the other is building projects usually paid from the General Fund. If Green Infrastructure has been incorporated into the project scope and project budget, then this cost is already included in the project cost and is not an "additional" cost.
5. The Knightsen Biofilter project requires Public Works Department staff support to keep it going, which could be funded by the Flood Control District in its role of providing technical guidance throughout the County on flood relief planning work. However, once the planning work identifies a preferred alternative and it goes into project design, then the work would have to be locally funded.
6. Elements of the Direct Trash Discharge Control Plan will be implemented within the road rights of way funded with Road Funds, within Flood Control District rights of way funded with Flood Control Funds, and on County owned property funded with General Funds.
7. About half of the creek cleanup work will occur in Flood Control District rights of way and funded with Flood Control Funds, and a small portion are on County creek-front property and funded with General Funds.
8. Program Administration includes such items as supervision, training, budget and contract management, grant writing, and strategic planning.

**Table 11 MRP 2.0 Implementation Budget: Most Likely Scenario (Unconstrained)**

MRP Provision	Description	MRP 1.0 2017-2018	MRP 2.0 Additional Provisions	MRP 2.0 2017-18 Budget	Funding Source for 2017-18 Budget		
					SUA 17	Road Fund	Other Depts
C2	Municipal Operations	\$32,000		\$32,000		\$32,000	
C2	Street Sweeping	\$200,000	\$125,000	\$325,000	\$125,000		\$200,000
C3	Development/LID Green	\$123,000		\$123,000	\$123,000		
C3.j	Infrastructure Planning						
C4	Industrial/Commercial Site Controls	\$225,000	\$92,000	\$92,000	\$92,000		
C5	Illicit Discharges	\$143,000		\$225,000	\$25,000		\$200,000
C6	Construction Controls	\$8,000		\$8,000	\$8,000		\$120,000
C7	Public Outreach	\$210,000		\$210,000	\$210,000		
C8	Monitoring	\$30,000		\$30,000	\$30,000		
C9	Pesticide Controls	\$25,000		\$25,000	\$25,000		
C10	Trash (Note 1)	\$456,000	\$69,000	\$525,000	\$525,000		
C10	Trash capture devices (Note 2)		\$577,000	\$577,000	\$300,000	\$277,000	
C10	Trash separator planning		\$100,000	\$100,000	\$100,000		
C10	On-land clean up	\$540,000	\$200,000	\$740,000	\$740,000		
C10	Adopt-a-Spot		\$25,000	\$25,000	\$25,000		
C10	Plastic bag ban program		\$25,000	\$25,000			\$25,000
C10	Polystyrene ban		\$75,000	\$75,000	\$75,000		
C10	Direct discharge controls (Note 6)	\$100,000	\$200,000	\$300,000	\$150,000	\$75,000	\$25,000

**Table 11 MRP 2.0 Implementation Budget: Most Likely Scenario (Unconstrained)**

MRP Provision	Description	MRP 1.0 2017-2018	MRP 2.0 Additional Provisions	MRP 2.0 2017-18 Budget	Funding Source for 2017-18 Budget			
					SUA 17	Road Fund	Other Depts	General Fund
C10	Creek clean-ups (Note 7)	\$120,000	\$30,000	\$150,000	\$135,000		\$15,000	
C11	Mercury Controls	\$15,000		\$15,000	\$15,000			
C12	PCB Controls (Note 3)	\$40,000	\$11,000	\$51,000	\$51,000			
C12	PCB/GI projects (Note 9)		\$13,050,000	\$13,050,000	\$50,000			\$13,000,000
C12	Identify development treatment							
C12	Local Source Properties		\$60,000	\$60,000	\$60,000			
C12	Regional Source Properties		\$25,000	\$25,000	\$25,000			
C12	County CIP Project (Note 4)		\$5,000	\$5,000	\$5,000			\$250,000
C15	Annual Report	\$70,000	\$500,000	\$500,000		\$250,000		
	RWQCB Fees	\$45,000	\$20,000	\$90,000	\$90,000			
	BIMID Cost Share	\$30,000		\$30,000	\$45,000			
					\$15,000	\$15,000		
	Drainage Inventory	\$50,000		\$50,000		\$50,000		
	Marina Program	\$10,000		\$10,000	\$10,000			
	Program Admin. (Note 8)	\$230,000		\$230,000	\$230,000			
	Knightesen Brofilter (Note 5)	\$10,000		\$10,000			\$10,000	
Totals		\$2,712,000	\$15,189,000	\$17,901,000	\$3,307,000	\$699,000	\$420,000	\$13,475,000

# Table 11 MRP 2.0 Implementation Budget: Most Likely Scenario (Unconstrained)

## Notes

1. Trash budget for MRP 1.0 represents projected costs from the past two years; the budget amount for MRP 2.0 Additional Provisions represents several small-scale planning activities such as maintenance plans, reports, and certifications.
2. The budget for full trash capture devices on drainage inlets includes \$300,000 for installation and \$277,000 for the first year of maintenance.
3. The PCB budget for MRP 1.0 is projected costs from the past two years; the budget amount for MRP 2.0 Additional Provisions is several small scale planning activities such as reports, schedules, and evaluations.
4. County Capital Improvement Program (CIP) projects are divided into two types: one is infrastructure projects like roads and bridges paid for from the Road Fund, and the other is building projects usually paid from the General Fund. If Green Infrastructure has been incorporated into the project scope and project budget, then this cost is already included in the project cost and is not an "additional" cost.
5. The Knightsen Biofilter project requires Public Works Department staff support to keep it going, which could be funded by the Flood Control District in its role of providing technical guidance throughout the County on flood relief planning work. However, once the planning work identifies a preferred alternative and it goes into project design, then the work would have to be locally funded.
6. Elements of the Direct Trash Discharge Control Plan will be implemented within the road rights of way funded with Road Funds, within Flood Control District rights of way funded with Flood Control Funds, and on County owned property funded with General Funds.
7. Some of the creek cleanup work will occur in Flood Control District rights of way and funded with Flood Control Funds.
8. Program Administration includes such items as supervision, training, budget and contract management, grant writing, and strategic planning.
9. This budget item is 30% of a \$43 million capital program and will pay for project planning, CEQA, permitting, and design activities in FY 2017/18.



**Table 12. Summary of MRP 2.0 Costs: Resource Based Scenario - Constrained**

Additional Requirements	Expenditures					Totals
	2016	2017	2018	2019	2020	
Trash	\$55,000	\$1,494,000	\$2,014,000	\$2,384,000	\$3,154,000	\$9,101,000
Green Infrastructure	\$0	\$91,500	\$41,000	\$889,000	\$43,000	\$1,064,500
Mercury and PCB	\$31,000	\$705,000	\$700,000	\$700,000	\$700,000	\$2,836,000
Sub Totals	\$86,000	\$2,290,500	\$2,755,000	\$3,973,000	\$3,897,000	\$13,001,500
MRP 1.0 Projected Annual Cost	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$15,000,000
MRP 2.0 Total Cost	\$3,086,000	\$5,290,500	\$5,755,000	\$6,973,000	\$6,897,000	\$28,001,500

**Summary of MRP 2.0 Costs: Most Likely Scenario**

Additional Requirements	Expenditures					Totals
	2016	2017	2018	2019	2020	
Trash	\$55,000	\$1,494,000	\$2,014,000	\$2,384,000	\$3,154,000	\$9,101,000
Green Infrastructure	\$0	\$91,500	\$41,000	\$889,000	\$43,000	\$1,064,500
Mercury and PCB	\$31,000	\$6,511,000	\$6,713,000	\$15,361,000	\$15,367,000	\$43,983,000
Sub Totals	\$86,000	\$8,096,500	\$8,768,000	\$18,634,000	\$18,564,000	\$54,148,500
MRP 1.0 Projected Annual Cost	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$15,000,000
MRP 2.0 Total Cost	\$3,086,000	\$11,096,500	\$11,768,000	\$21,634,000	\$21,564,000	\$69,148,500



## **Appendix A**

# **Report to the Transportation, Water and Infrastructure Committee**

April 10, 2017

Detailed cost analysis of the additional requirements in the  
Municipal Regional Permit 2.0

<b>Overview ad Corrections .....</b>	<b>Page 2</b>
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## **Overview and Corrections**

### **Overview**

The detailed cost analysis that follows for Green infrastructure, Trash, Mercury, and PCBs, use the Appendix in the October 13, 2016 Financial Report to the Committee as a base document. Each one of these four additional requirements has been updated to include any corrections noted below and any new information on costs. It should be noted that although the cost analysis in this Appendix has been updated, the assumptions are still based on the worst case scenario outlined in the October 13, 2016 Financial Report.

All of the cost data presented in this Appendix is summarized in Appendix Tables 1 through 4 at the end of this Appendix. These cost estimates are intended to provide an accuracy level commensurate with the early stages of program planning and development the County is currently exploring. All of these estimates will become more accurate as time goes on and more information is known and experience gained with implementing provisions of MRP 2.0.

### **Corrections**

There were several interpretations of permit requirements that were incorrect and impacted him for the October 13, 2016 Committee report. This section reviews the general assumptions made in preparing the cost estimates, the incorrect interpretations, and the corrections.

The October 13, 2016 Financial Report provided a worst case cost scenario, assuming a modest amount of source properties and a small amount of private development treating PCBs, and the County implementing the bulk of the PCB load reduction measures. The worst case scenario cost for the four additional provisions (Trash, Green Infrastructure, Mercury, and PCBs) was \$202 million. The cost of the four additional provisions plus the annual compliance cost of MRP 1.0 resulted in the total estimated cost for implementing MRP 2.0. After adding the \$3 million annual cost of implementing MRP 1.0, the total five-year permit cost for MRP 2.0 was \$217 million.

There were three primary assumptions in the Financial Report that impact the worst case scenario analysis:

- **2019 Load Reduction.** It was assumed there was a PCB load reduction requirement every year from 2018 to 2020. In fact, there is only a load reduction requirement in 2018 and 2020, and not in 2019. Correcting this assumption reduced the total cost of implementing PCB control measures by about \$13 million. This is also shown in Appendix Table 5 and explained in more detail further in the Appendix.
- **Loads Aren't Additive.** It was also assumed that PCB load reductions do not carry forward from year-to-year. In fact, when a control measure results in a load

reduction that load reduction does carry forward, providing the control measure is maintained on an annual basis to ensure the load reduction is permanent. Correcting this assumption, and clarifying the assumption of 0.5 grams per year load reduction from private development in 2018, 2019, and 2020, had a net reduction in the total cost of implementing PCB control measures of about \$1 million. It turns out that clarifying and correcting these two assumptions balance each other out.

- **Unit Treatment Costs.** The financial analysis used \$215,000 per treated acre as the cost for Green Infrastructure control measures implemented by the County. When the Financial Report was prepared the cost analysis was peer-reviewed, and the peer review consultant indicated the cost range for implementing Green Infrastructure in the Bay Area was between \$200,000 and \$365,000 per treated acre. Subsequent to the Committee meeting, the peer review consultant analyzed cost data from Southern California. The cost data shows the average cost of implementing Green Infrastructure in that part of the State is about \$110,000 per treated acre. Adopting a unit cost of \$110,000 per treated acre would roughly reduce the cost estimates in the Financial Report by half. However, staff recommends continuing to use \$215,000 per treated acre at this point in the planning process. The Bay Area is in the early stages of implementing Green Infrastructure and the unit costs will undoubtedly go down with increased experience. Southern California is several years ahead of the Bay Area in stormwater permit requirements and has been implementing Green Infrastructure improvements longer. We can certainly learn from the experience in Southern California, however, there remain differences in soils, climate, and institutional/financial arrangements that indicate a prudent approach would be to use a cost at the low end of the Bay Area cost range. Using \$215,000 per treated acre is consistent with that prudent approach. The other assumption that affects Green Infrastructure costs is its efficiency in reducing PCB loads. Green Infrastructure treats runoff from land containing PCBs but is not 100% effective at doing so. The Regional Board assigns a default efficiency factor of 70% to Green Infrastructure. A remediation project, on the other hand, addresses PCBs on a specific property to prevent PCBs from running off the property. A remediation project has a 100% efficiency factor. A 70% efficiency factor is used in this report unless noted otherwise.

The corrections noted above reduce the worst case cost scenario for MRP 2.0 to about \$200 million over a five-year permit term.



# **GREEN INFRASTRUCTURE**

## **Developing a Green Infrastructure Plan For Unincorporated Contra Costa County A requirement of the current Municipal Regional Permit (MRP 2.0)**

**Updated April 10, 2017**

### **I. Objective and Purpose**

The following are the stated objectives and purpose of the Green Infrastructure Plan requirement in the Municipal Regional Permit 2.0:

- Include LID drainage design into public projects
- Provide an implementation guide and planning tool to meet TMDL requirements
- Develop a reasonable assurance analysis that waste load allocations will be met
- Monitor/track implementation effectiveness
- Provide a vision and strategy to convert gray infrastructure to green infrastructure
- Provide criteria and methodology to prioritize Green Infrastructure projects
- Incorporate other waste load reduction plans into a Green Infrastructure Plan, creating an overall master plan
- Track area treated by Green Infrastructure and track amount of directly connected impervious surfaces

Note: This provision C.3.j defines the concept of and outlines the requirements for Green Infrastructure. The compliance costs for implementing Green Infrastructure to effectuate pollutant load reduction, however, will be found in the PCB requirements.

### **II. Plan Development Process and Cost**

The following is a step by step process and resultant costs to meet Green Infrastructure Plan requirements specified in the Municipal Regional Permit 2.0:

#### Provision C.3.j.i Green Infrastructure Program Plan Development

##### **1. Prepare a Green Infrastructure Plan framework document. (2017)**

This will describe the detailed process for the County Board of Supervisors to approve a Plan by June 30, 2017. The framework must include a statement of purpose, specific tasks, and time frames to complete the required elements listed in MRP 2.0. This will entail a primary author, likely an engineer or consultant, for two weeks at \$16,000 (80 x 200), coordination with staff at \$2,000, three team meetings at \$1,500 each, and a review process at \$5,000. To receive Board Approval will require a TWIC meeting with a report and other documentation at \$5,000 and a Board of Supervisors report and presentation at \$2,000.

- Green Infrastructure Plan framework document. \$27,500
- Board approval process. \$7,000

**2.a. Develop a mechanism to map and prioritize GI projects on a watershed basis. (2019, 20)** It is assumed we will use San Francisco Estuary Institute's (SFEI) GreenPlanIT tool to some extent to provide water chemistry and water quality parameters for pollutant loading. The Clean Water Program has developed a program to map areas for potential and public planned projects. This program is a GIS-based tool that uses land-use, pollution loading, hydrology, and cost data to optimize the placement of Green Infrastructure projects. To use the tool, we will need to provide land-use data at \$1,000, drainage inventory at \$50,000, data on source properties at \$10,000, data for developing feasibility criteria, such as utility location, community design, neighborhood compatibility, soil type, right-of-way availability, etc. at \$50,000, data for developing prioritization criteria, such as water quality parameters, TMDL load reduction requirements, etc. at \$10,000, and coordination at \$5,000. We will also need to ensure data transfer is compatible with our various CIPs (ie, CRIP, Capital Projects, FCCIP) at \$5,000. Finally there will be an annual cost to utilize SFEI's GreenPlanIT at \$5,000 per year. GreenPlanIT is a new program still under development and these estimated costs will need to be verified with SFEI.

For private projects it is assumed we will use the Clean Water Program's tool for tracking purposes, and it is assumed project prioritization is NOT required as implementation is dependent on developer's independent schedules. This will entail estimating Green Infrastructure projects proposed developments will construct, identifying all Green Infrastructure projects under design by developments, and providing this data to the Clean Water Program at least once a year at \$5,000 per year. Identifying opportunity areas on private property, such as parking lots, will entail determining criteria for what types of opportunity areas the County has the jurisdiction to impose Green Infrastructure, and when and how, at \$25,000, reviewing aerial imagery and identifying opportunity sites at \$25,000, and determining and implementing the best way to require Green Infrastructure on private parcels at \$25,000.

- Mapping and prioritization mechanism for public projects. \$131,000
- Mapping and prioritization mechanism for private projects. \$75,000
- Annual cost to determine private project data. \$5,000
- Annual operational costs. \$5,000

**2.b. Outputs from the mapping and prioritization mechanism. (2019)** It is assumed that the cost for the outputs such as maps, project lists, project ranking, etc., are included in the development of the mechanism itself (C.3.j.i.2.a). This may change as we better understand what the output needs are and how they will be developed.

- No additional cost for this item.

**2.c. Develop urban built environment retrofit targets. (2019)** It is assumed that the load reduction calculations to determine the targets will be included in the costs for Provision C.11 and C.12. There will be an administrative cost to adapt the load reduction calculations into targets and prepare a report at \$10,000 each for public and private spaces.

- Targets to retrofit the public urban built environment. \$10,000
- Targets to retrofit the private urban built environment. \$10,000

**2.d. Develop a process for tracking and mapping completed GI projects. (2019, 20)** It is assumed this capability will be available for both public and private projects with SFEI's tool and general coordination will be all that is needed at \$2,000 each year.

- Annual coordination costs. \$2,000

**2.e. Develop guidelines for project development, design, and construction to ensure that green infrastructure is not precluded but is included in projects. (2019)** The process to develop these guidelines would be required for all types of projects, such as roads, buildings, parking lots, parks, airports, and drainage. It is assumed this would be done at a regional level and our role would be to coordinate the development of guidelines. For example, perhaps MTC for ABAG would take the lead in developing some or all of these guidelines. There would be a cost share to the County for the regional entity to hire the consultant at \$5,000, staff involvement at \$10,000, and staff cost to tweak the guidelines to meet the County's specific needs at \$5,000.

- Develop a suite of guidelines. \$20,000

**2.f. Prepare standard specifications and standard plans. (2019)** It is assumed this could be done at a regional level, however, we have a significant amount of unique requirements for specifications and construction details that would add additional costs. There would be a cost share to the County for the regional entity to hire a consultant at \$5,000, staff involvement at \$10,000, and staff cost to tweak the standard specifications and standard plans to meet the County's specific needs at \$25,000.

- Prepare standard specifications and plans. \$40,000

**2.g. Develop options to include hydro-modification in GI projects. (2019)** Hydro-modification must be included in Regulated Projects but a variety of options could be used for non-Regulated Projects. The options analysis should consider watershed health, creek improvements, TMDL load reductions, etc. To achieve this will require developing an options analysis at \$25,000, a policy level discussion and decision at \$10,000, and staff cost to integrate the options into our project development, design, and construction checklists and other planning and implementation processes at \$20,000.

- Develop options for HMP. \$55,000

**2.h. Update County's foundational planning documents. (2019)** This entails updating the County's General Plan, Specific Plans, Transportation Plan, the Flood Control District's 50 Year Plan, and other key planning documents that impact the design of impervious surfaces. The cost to update the General Plan is likely \$100,000, to develop a Flood Control District plan is also likely \$100,000, and to modify the Transportation Plan is likely \$50,000. Other plans would have to be identified and update costs estimated. These costs represent a placeholder estimate, as it is difficult to estimate the cost of updating these documents until more specifics are known about the Green Infrastructure program, which will be determined when we get closer to implementation and the program is better defined.

- Update County planning documents. \$250,000

**2.i. Develop work plan to ensure GI and LID measures are included in developing and amending future planning documents. (2019)** This would entail developing a process in those departments and programs that have or will develop or update a key planning document (primarily DCD and PWD) to ensure GI and LID design elements and requirements are included at \$25,000.

- Develop work plan. \$25,000.

**2.j. Develop work plan to complete prioritized GI projects. (2019)** This work plan is meant to ensure completion of projects identified in an Alternative Compliance Program or part of the Early Implementation list of projects, but these underlying processes will also be used for future GI projects. This will entail developing a separate Green Infrastructure Capital Improvement Program (CIP) at \$50,000, updating our existing road infrastructure CRIP at \$25,000, and modifying our Facilities CIP in Capital Projects at \$25,000, and developing a work plan outlining the process to achieve this at \$25,000.

- Develop work plan and CIP modifications. \$125,000

**2.k. Develop a Green Infrastructure Financing Plan. (2019)** This requires an evaluation and prioritization of project funding options, such as Alternative Compliance funds, grants, transportation funding from federal, state, and local sources, etc. To achieve this will require research of available funding options, analysis of which projects best fit the various funding options, and development of a strategic plan to go after specific funding for specific projects at \$25,000.

- Develop Financing Plan. \$25,000

**3. Develop and adopt policies, ordinances, etc., to ensure implementation of the Green Infrastructure Plan. (2019)** This will entail developing standard conditions of approval at \$10,000, revising design manuals and checklists at \$10,000, developing ordinance code language at \$10,000, and



going through the review and adoption process for the ordinance code revisions at \$25,000.

- Adopt policies and ordinances. \$45,000

**4.a. Conduct public outreach on the Green Infrastructure Plan and its requirements. (2017, 18, 19, 20)** This will entail making presentations at various organizations, such as the Contra Costa Watershed Forum, East Bay Municipal Engineers, Public Managers Association, City-County Engineering Advisory Committee, etc. at \$5,000, and planning, preparing, and holding three workshops at \$2,000 each.

- Annual cost to conduct public outreach. \$11,000

**4.b. Provide training to staff on the Green Infrastructure Plan, its requirements, and implementation methods. (2017, 18, 19, 20)** This will entail developing a staff training program at \$3,000, and implementing a staff training program at \$3,000 per year.

- Develop staff training. \$3,000
- Annual cost to train staff. \$3,000

**4.c. Educate County elected officials on the Green Infrastructure Plan and its requirements and implementation methods. (2017, 18, 19, 20)** This will entail planning, preparing, and holding a workshop for the County Planning Commission, the Transportation, Water, and Infrastructure Committee, and the Board of Supervisors at \$5,000 and conduct a workshop at \$2,000 each year thereafter.

- Develop and conduct workshop for County elected officials. \$5,000
- Annual cost to hold workshop. \$2,000

**5. Report on Green Infrastructure planning progress. (2017, 18, 19, 20)** This entails preparing a report each year outlining the progress on developing and implementing the County's Green Infrastructure Plan at \$5,000 per year.

- Annual cost to report on Green Infrastructure Plan progress. \$5,000

Provision C.3.j.ii. Early Implementation of Green Infrastructure Projects (No Missed Opportunities)

**1. Prepare and maintain a list of public and private GI projects, and infrastructure projects that could include GI measures. (2017, 18, 19, 20)** This would entail reviewing all development projects and developing a list of GI projects and other projects that could include GI at \$5,000, and reviewing our current CIP project lists to determine which projects could include a GI

component at \$5,000. There would also be an annual cost to update and maintain the list at \$1,000 per year for each list.

- Prepare list of public and private GI projects. \$10,000
- Annual cost to update project lists. \$2,000

- 2. Prepare a status summary for each public and private GI project. (2017, 18, 19, 20)** The intent of this requirement is to report how each public and private project is incorporating Green Infrastructure elements, and explain why Green Infrastructure was not added to those projects that do not have a Green Infrastructure element. These status summaries would be provided in the Annual Report. This would entail researching and drafting a summary report for each private development project each year at \$3,000 and for each public project each year at \$3,000.

- Annual cost to provide project status reports. \$6,000

#### Provision C.3.j.iii. Participate in Processes to Promote Green Infrastructure

- 1. Influence regional, state, and federal agencies to fund and incorporate GI measures into local projects. (2017, 18, 19, 20)** This requires an annual effort to track political, grant, and financial processes at all levels of government and advocate for the development of Green Infrastructure, the need for additional funding, and ways to increase efficiencies. It is assumed this would be performed at the regional level (for example BASMAA) and would result in a cost share for the County and staff coordination of \$5,000 each year.

- Annual cost to advocate for Green Infrastructure. \$5,000

- 2. Report on participation goals. (2017, 18, 19, 20)** It is assumed this would be performed at a regional level and would entail the County's share in an effort to report on the goals and outcomes of participating in the promotion and advocacy for Green Infrastructure each year at \$5,000.

- Annual cost to develop participation goals. \$5,000

- 3. Prepare a plan and schedule for new advocacy efforts. (2019)** This is required in the 2019 Annual Report. It is assumed this would be performed at a regional level and would entail the County's share in an effort to develop a plan of new and ongoing efforts to promote and advocate for Green Infrastructure at \$5,000.

- Prepare an advocacy plan and schedule. \$5,000

#### Provision C.3.j.iv. Tracking and Reporting Progress

- 1. Develop regionally consistent tracking method for Green Infrastructure. (2019)** The intent is to have a tracking system that has

information from each jurisdiction (in a format that is consistent throughout the Bay Area) of Green Infrastructure, treated area, and connected and disconnected impervious areas for both public and private projects. The system must also provide information necessary to develop reasonable assurance analysis for TMDL waste load allocations. It is assumed this would be developed at a regional level, possibly through SFEI or BASMAA, with a required cost share from the County at \$10,000 and staff coordination costs of \$10,000.

- Develop tracking method for Green Infrastructure. \$20,000

**2. Report progress on tracking methods each year. (2017, 18, 19, 20)**

This will entail reviewing the activities for the year, extracting information from the regional tracking entity, and preparing a report for the Annual Report at \$2,000.

- Annual cost to report on tracking method. \$2,000

**3. Submit tracking methods and status in 2019 Annual Report. (2019)**

This information would have been developed in the two items above so no additional cost is needed.

- No additional cost for this item.

# TRASH

## **Meeting the Trash Load Reduction Schedule for Unincorporated Contra Costa County A requirement of the current Municipal Regional Permit (MRP 2.0)**

**Updated April 10, 2017**

### **I. Objective and Purpose**

The following is the objective and purpose of the Trash Load Reduction requirement in the Municipal Regional Permit 2.0:

- Eliminate trash in our waterways and receiving water bodies

The following are observations of the Trash Load Reduction requirements:

- Full trash capture devices installed in drainage inlets or in drainage systems is the preferred trash load reduction measure
- Creek clean-ups have been devalued as a trash load reduction measure
- Trash load reduction offsets are a temporary solution
- The County did not meet the required 60% load reduction by 2016, however, neither did nine of the 19 cities in the County

### **II. Trash Load Reduction Process and Cost**

The following is a step by step process and resultant costs to meet the Trash Load Reduction requirements specified in the Municipal Regional Permit 2.0:

#### Provision C.10.a Trash Reduction Requirements

##### **a.i. Meet the prescribed trash reduction targets. (2017, 2019)**

The County must reduce trash discharges by 70% by July 1, 2017, and 80% by July 1, 2019. In addition, the County should have achieved 60% reduction by July 1, 2016. If the 60% reduction milestone is not achieved, then the County must prepare a plan and schedule for implementing additional trash load reduction control actions to meet 70%. The County did not reach the 60% milestone, achieving 43% by July 1, 2016. Meeting this requirement will entail developing a plan and schedule at \$25,000 in 2016 and 2018. The plan to meet 70% load reduction by July 2017 includes four key elements: full trash capture devices, on-land cleanups, community-based trash abatement measures, and direct discharge controls. These four key elements and their estimated implementation costs are described in more detail below.



- Develop plan and schedule for 2016 and 2018. \$25,000 each

**Full Trash Capture Devices.** There are two types of full trash capture: screens or similar features that capture trash at individual storm drain inlets, or hydrodynamic separators on trunk storm drain lines that capture trash coming from many individual inlets. The County is proposing to invest \$300,000 to install full trash capture devices (screens) in storm drain inlets located in high and very high trash generation areas. Based on a 2013 project to install individual full trash capture devices, the average construction cost is about \$600 per unit. Adding to the cost of construction the cost of project planning, development, design, and construction management at \$400 brings the total cost per unit to \$1,000. In early 2017 the County advertised a project to install screens and the average of the three lowest bidders was \$738, so using a total unit cost of \$1,000 is still reasonable. With this budget, the County will be able to retrofit about 300 storm drain inlets. Annual maintenance costs, utilizing a Vactor truck, driver, and assistant, are estimated at \$600 per unit three times a year for a total annual unit cost of \$1,800. As a project, individual screen inserts can be installed fairly quickly and will be utilized in the first two years. Trash separators are much larger facilities and must go through a full design process, including environmental review, and take about two years to plan and install. In the last three years of the permit three trash separators will be installed at an average cost of \$800,000 each. The cost for separators can vary widely depending on the treatment area, utilities, traffic, etc. It is also assumed that maintenance costs for trash separators, cleaned three times a year, are \$10,000 per unit. Even though separators have a high initial capital cost, the annual costs are much less providing a more cost effective lifecycle cost investment.

- Convert drainage inlets to full trash capture (2017). \$300,000
- Convert drainage inlets to full trash capture (2018). \$300,000
- Annual cost to maintain 300 full trash capture inlets. \$540,000
- Install three hydrodynamic trash separators (2019 - 2020). \$2,400,000
- Annual cost to maintain three trash separators. \$30,000

**On-Land Clean Up.** The County currently has a contract with a debris hauler that provides general pickup service of trash along the County's roadways and within the unincorporated communities. This contract would be expanded to include trash pickup in additional areas, and/or more frequent pickup in the existing service area at \$200,000.

- Additional on-land cleanup services. \$200,000

**Community-based Trash Abatement Measures.** Trash abatement in heavy trash load areas will be more effective if they are supported by the community and the community actively participates. An example of a

community-based trash abatement measure would be the proposed Adopt-a-Spot program, an extension of the County's successful Adopt-a-Road program. In this case, a person, group of neighbors, or a neighborhood would adopt a drainage inlet or other trash collection feature and actively maintain it. This would entail researching and identifying feasible community-based trash abatement measures and where they could be applied at \$5,000, developing a specific abatement measure, such as the Adopt-a-Spot program, going through the program approval process, and getting it set up and operating at \$25,000, and ongoing annual operational costs at \$10,000.

- Develop a community-based trash abatement program. \$5,000
- Implement an Adopt-a-Spot program (or other program). \$25,000
- Annual operational costs. \$10,000

**Direct Discharge Control.** This control measure and compliance costs are discussed in more detail later on in provision e.ii.

**a.ii. Update trash generation areas. (2016)** Trash generation areas were developed, mapped, and submitted in February 2014 using the best data at the time. Based on information and observations since then, the County must update the trash generation areas with the 2016 Annual Report. This will entail analyzing data from the trash generation areas, determine if the trash generation areas are in the correct trash generation rate category (Low, Moderate, High, or Very High), and update the Trash Generation Area Maps at \$25,000.

- Updating the Trash Generation Area Maps. \$25,000

**a.ii.a. Establishes full trash capture systems as the standard.** Requires trash prevention and control actions be equivalent to or better than full trash capture systems, and defines this as "essentially no trash discharge except in very large storm flows".

- There is no cost for this item

**a.ii.b. Modify private storm drain systems to include full trash capture. (2018)** The County must ensure that trash from private storm drains that drain to public drainage facilities is captured with full trash capture systems or the equivalent. The County must map all properties greater than 10,000 ft.<sup>2</sup> that drain directly to public drainage systems by July 2018, indicate the trash generation rate category they are in, and indicate their trash control status. The County has 3129 acres in the Moderate trash generation rate category, 1348 acres in the High trash generation rate category, and 131 acres in the Very High trash generation rate category. These numbers represent the acres of trash generation categories that are within the Urban Limit Line plus a few key major roads

that connect communities. Meeting this requirement will entail developing a map of 10,000 ft.<sup>2</sup> parcels at \$25,000, develop an inventory of and map private drainage systems throughout the County that drain to public systems at \$50,000, determine the trash capture status of parcels that drain to public drainage systems at \$10,000, develop a legal means to require full trash capture devices on private property at \$50,000, and implement full trash capture requirements on private land at \$25,000.

- Modify private storm drain systems. \$160,000

**a.iii. Install mandatory minimum full trash capture systems.** The County must install and maintain full trash capture devices to treat runoff from 157 acres (30% of the County's retail/wholesale land area). This requirement was in MRP 1.0 and was completed with the help of grant funding. There is no additional cost for MRP 2.0.

- No additional costs.

**b.i.a. Develop a Maintenance Plan to ensure maintenance of full trash capture devices. (2017, 18, 19, 20)** The County must maintain full trash capture devices to prevent flooding, plugging of the 5 mm screen, or overflow of the device's trash storage reservoir. Inspection must occur at least once a year, and in High or Very High trash generation rate category areas at least twice per year. The capacity of a device's trash storage reservoir cannot exceed 50% at the time of inspection. This will entail developing a maintenance checklist to ensure appropriate data is gathered with each inspection and developing a maintenance schedule, by trash generation rate category, at \$25,000, developing an acceptable maintenance report format to include the trash storage capacity at the time of maintenance at \$10,000, and budget the cost to maintain full trash capture devices at \$1,800 each per year. The County currently has 139 full trash capture devices in place. The cost to maintain the current full trash capture devices was part of MRP 1.0. The cost increase associated with MRP 2.0 is noted in provision C.10.a.i above.

- Develop maintenance plan for full trash capture devices. \$35,000
- Additional annual cost of maintenance included in C.10.a.i.

**b.i.b. Maintain maintenance records and report annually on effectiveness of full trash capture devices. (2017, 18, 19, 20)** The County must retain specific information for each full trash capture device, including the date of maintenance, capacity of the trash storage reservoir, any flooding or special problems, any damage that would reduce its function, etc. This information must be reported each year with the Annual Report. All this information will be developed with the maintenance plan identified above, so the only additional cost is for the Annual Report at \$3,000 per year.

- Annual cost to prepare the Annual Report maintenance log. \$3,000

**b.i.c. Annual certification of full trash capture systems. (2017, 18, 19, 20)** The County must certify each year that their full trash capture systems meet permit compliance. Areas that drain to full trash capture systems are considered to be in a Low trash generation rate category. The cost to develop the certification for the Annual Report is \$1,000 per year.

- Annual cost to provide certification. \$1,000

**b.ii.a. Document trash management actions other than full trash capture devices. (2017)** The County must identify and document Other Trash Control Actions, defined as all actions other than full trash capture systems. Documentation must include a description of the action, level of implementation, timing and frequency of implementation, standard operating procedures, location, drainage area affected, tracking and enforcement procedures, etc. The County is contemplating several additional control measures such as increasing street sweeping in commercial areas, providing street sweeping in areas currently not swept, expanding the Adopt-a-Road program to include visual assessments to get credit for trash collection, installing curb and gutter in areas with roadside ditches to facilitate street sweeping, or converting roadside ditches to bio-retention facilities, which also act as trash capture devices. This will entail evaluating each potential trash control action, developing a tracking system to gather the required data and provide information for the Annual Report to achieve approximately 27% credit towards the 70% goal at \$25,000.

- Document trash management actions. \$25,000

**b.ii.b. Conduct visual assessments to determine effectiveness of other trash management actions. (2019)** The County must conduct visual assessments of each trash generation area that has Other Trash Management Actions to determine their effectiveness (full trash capture devices are handled separately). This would entail conducting observations along sidewalks, curbs and gutters, and other places associated with trash generation, at locations covering at least 10% of the trash management area's street miles, and at a frequency consistent with the estimated trash generation rates at \$50,000.

- Conduct visual assessments. \$50,000

**b.iii. Calculate trash discharge reduction each year. (2017, 18, 19, 20)** The County must calculate the reduction in trash discharge to receiving waters based on the formula provided in MRP 2.0 and submit it with each Annual Report. This will entail gathering the required data to perform the calculation at \$5,000 each year.



- Annual calculation of trash discharge reduction. \$5,000

**b.iv. Develop a source control strategy. (2019)** The County may adopt source control actions to reduce trash load reductions, which may be valued at up to 10% of the total required load reduction. An example of a source control action would be adopting a ban on plastic bags. This was proposed two years ago and the Board decided not to go forward at that time for a variety of reasons. However, considering the current statewide ban on plastic bags and the value of load reduction this represents, the Committee authorized staff to explore implementing this source control measure at their October 13, 2016 meeting. Developing a strategy would involve identifying possible source control measures, evaluating those measures, determining the feasibility of viable measures, and developing a recommendation and draft strategy for review and approval at \$5,000. Adopting a ban on polystyrene food containers would entail preparing an environmental document at \$5,000, coordinating with surrounding cities at \$25,000, developing an ordinance at \$10,000, going through the ordinance review process at \$25,000, and the ordinance approval process at \$10,000. Enforcing a ban on plastic bags would entail taking a quick representative sample of retail and commercial establishments to determine percentage of compliance at \$5,000, then a more systematic monitoring of all applicable establishments over a longer period of time to include outreach, awareness, and enforcement at \$10,000 per year.

- Develop a source control strategy. \$5,000
- Adopt a ban on polystyrene containers. \$75,000
- Initial assessment of plastic bag ban compliance. \$5,000
- Annual cost of monitoring plastic bag ban. \$10,000

**b.v. Develop receiving water monitoring program, with tools and protocols, and conduct the monitoring. (2018, 19, 20)** BASMAA will be developing the receiving water monitoring program. The cost to the County will be a share of the start-up costs to develop the program in 2018 at \$10,000 and an annual cost to maintain the receiving water monitoring program at \$5,000.

- Develop receiving water monitoring program cost share. \$10,000
- Annual cost to manage the program. \$5,000

**c. Select trash hotspots and conduct cleanups.** This requirement is the same as MRP 1.0, so there are no additional costs with the new MRP 2.0.

- No additional costs.

**d. Prepare amendments to the Trash Load Reduction Plan. (2016, 18)** This will entail preparing amendments to the County's Trash Load

Reduction Plan to meet the required load reduction of 70% by 2017 and 80% by 2019. These costs are included in section C.10.a.i.

- There is no additional cost for this item.

**e.i. Evaluate creek and shoreline cleanups as a trash control measure. (2017, 18)** The County is allowed to utilize creek and shoreline cleanups as an offset to the trash load reduction requirement. The offset is calculated from a formula contained in MRP 2.0. Based on the formula, the County will receive 1% offset for every 12.4 cubic yards of trash picked up, with a maximum offset of 10%. A small cleanup can fill up one or two 6-yard debris boxes and an average cleanup can fill up one 20-yard debris box. A standard 10 wheel dump truck in our Maintenance Division holds about 10 cubic yards. In 2019 the volume will be increased to 37.6 cubic yards of trash to receive a 1% offset. To meet this offset will entail identifying partners to conduct creek and shoreline cleanups, determining the cost to coordinate and conduct the cleanups, calculating the percent offset to the trash load reduction target, evaluating their benefit to meeting the County's requirement at \$25,000, and analysis of its annual effectiveness at \$5,000 per year.

- Evaluate creek cleanups as a control measure. \$25,000
- Annual analysis of effectiveness. \$5,000

**e.ii. Evaluate direct trash discharge control measures to help meet the trash load requirement. (2017, 18)** The County is allowed an offset to the trash load reduction requirement for controlling direct discharges of trash to receiving waters from non-storm drain system sources. The offset is calculated from a formula contained in MRP 2.0. The formula results in the same trash volumes as C.10.e.i, 12 cubic yards in 2017 and 38 cubic yards in 2019. The maximum offset is 15%. Cleaning up homeless encampments along creeks would be the most applicable example of a direct discharge of trash from a non-storm drain system source. The County has been spending over \$100,000 a year on homeless encampment cleanups with MRP 1.0. Unfortunately, homeless encampments are usually re-populated within a couple of weeks. This trash discharge control measure would have to prevent re-population of homeless encampments to be effective. This will entail taking a leadership role and coordinating with various County departments, non-profit organizations, and cities to develop an effective homeless encampment removal plan, determining the responsible agency for implementing the various components of the plan for the applicable creeks in the County, and determining the responsible agency for enforcement of the plan to prevent re-population at \$50,000. The County share to implement and enforce the plan each year at \$300,000 (minus \$100,000 existing costs in MRP 1.0) and analysis of its annual effectiveness at \$5,000 per year.

- Develop a homeless encampment removal plan. \$50,000
- Annual cost to implement and enforce the plan. \$200,000
- Annual analysis of effectiveness. \$5,000

**f.v.b. Prepare non-compliance report IF the County does not meet the trash load reductions required in 2017 or 2019.** If the County does not meet 70% trash load reduction by 2017 or 80% load reduction by 2019, a noncompliance report must be prepared and submitted to the Regional Board. The report must include a plan and schedule to implement full trash capture systems, or equivalent, to attain the required reduction. It is assumed that the fallback plan is to convert all inlets in non-attainment areas to full trash capture. The County has about 7,300 drainage inlets, of which 1,740 are located in Moderate, High, or Very High trash generation areas. It is assumed that 10% of the 1,740 conversions to full trash capture would present an operational problem and require extensive modifications of the storm drain inlet to resolve. For example, if a drainage inlet is functioning marginally in collecting stormwater and a full trash capture device would cause flooding, then perhaps an additional inlet would need to be installed just downstream to handle the overflows. Implementing this option would entail identifying the drainage inlets in the non-attainment areas and assessing their ability to be converted to full trash capture at \$50,000, develop the non-compliance report at \$25,000, develop a project and install full trash capture devices in 1,566 drainage inlets at \$1,000 per inlet (\$600 installation plus \$400 in project planning, development, design, and construction management), develop a project and construct drainage inlet modifications for 174 drainage inlets at \$5,000 per inlet, and budget the cost to maintain these additional full trash capture devices at \$1,800 each per year.

**Note:** These activities and costs will not be necessary if the required trash load reduction targets are attained.

- Drainage system assessment. \$50,000
- Develop the non-compliance report. \$25,000
- Convert drainage inlets to full trash capture. \$870,000
- Modify inlets to accommodate full trash capture. \$1,570,000
- Annual cost to maintain 1,740 full trash capture inlets. \$3,100,000

# MERCURY

## **Meeting the Mercury Load Reduction Schedule for Unincorporated Contra Costa County A Requirement of the Current Municipal Regional Permit (MRP 2.0)**

**Updated April 10, 2017**

### **Objective and Purpose**

The following are the objectives and purpose of the Mercury Load Reduction requirement in the Municipal Regional Permit 2.0:

- Meet the TMDL schedule for all permittees in the San Francisco Bay Area to remove 48 grams per year by the end of the permit term
- Implement and test a variety of control measures to remove Mercury
- Identify and abate source properties

The following are observations of the Mercury Load Reduction requirements:

- Green Infrastructure is the most favored overall control measure.
- Old industrial and old urban land uses are considered the overall primary source of Mercury, other than source properties.

### **II. Mercury Load Reduction Process and Cost**

The following is a step by step process to meet the Mercury Load Reduction requirements specified in the Municipal Regional Permit 2.0:

**Note:** Many of the control measures to reduce PCB loads will also reduce Mercury loads, so the cost to comply with almost all the Mercury provisions is included in the compliance costs for PCBs.

#### Provision C.11: Reducing Mercury Levels in the Bay

**a.i. Implement control measures to reduce Mercury.** The County must implement source and treatment control measures to reduce Mercury loads, with a specific requirement to reduce 1.37 grams per year by July 2020. All co-permittees within the County must reduce Mercury loads by 9 grams per year by 2020. The County's share of that load reduction, based on population as of January 2015, is 15.26%. The cost to implement the control measures identified in this provision is covered in the provisions outlining the control measures.

- No additional cost for this item.



**a.ii.1. Identify current and proposed watersheds or management areas with control measures. (2016)** The County must identify the watersheds or management areas (portions of watersheds) where Mercury control measures are currently being implemented and where new control measures will be implemented. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**a.ii.2. Identify current and new control measures. (2016)** The County must identify the various types of control measures that are currently being implemented (primarily street sweeping) and control measures that will be implemented. Control measures can include abating source properties, constructing green infrastructure treatment facilities, sweeping streets in management areas, cleaning drainage inlets, redeveloping contaminated areas, diverting stormwater from pump stations to sewer treatment plants, and flushing streets. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

**Note:** It should be noted that like PCBs, Mercury attaches to sediment particles, so control measures that remove sediment are an effective way to remove Mercury. However, while PCBs can be highly concentrated in source properties, Mercury is dispersed more evenly throughout the watershed, so control measures that focus on remediating source properties is not as effective with Mercury as with PCBs.

- No additional cost for this item.

**a.ii.3. Develop implementation schedule. (2016, 17, 18, 19, 20)** The County must develop a schedule to implement new control measures. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**a.ii.4. Implement control measures to meet load reduction requirements. (2018, 2020)** The County must implement control measures to reduce Mercury by at least 1.37 grams per year with Green Infrastructure. The calculation of load reduction is based on the land-use type of the drainage area flowing to the control measure. Treating sediment laden stormwater draining from, or preventing sediment from mobilizing in, areas with Old Industrial land uses yields a load reduction of 1.3 grams per acre per year, while Old Urban land uses yields 0.215 grams per acre per year, and New Urban/Other land uses yields 0.033 grams per acre per year. "Old" land use areas are those generally

constructed before 1980 and "New" constructed after 1980. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**a.iii.1. Develop a Progress Report on implementation of control measures. (2016)** The County must develop a progress report by April 2016 outlining the steps taken to develop a list of watersheds, identify control measures, and justify the selection of watersheds using monitoring data. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**a.iii.2. Develop an implementation status report for each Annual Report. (2016, 17, 18, 19, 20)** The County must develop a status report each year that includes the number, type, and location of control measures (included in C.11.a.ii.2), the description, scope, and start date of the control measures plus implementation progress milestones and schedule for milestone achievement (partially included in C.11.a.ii.2 and C.11.a.ii.3), and indicate the roles and responsibilities of each participating co-permittee where multiple jurisdictions are involved. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**a.iii.3. Annual updates of control measures and implementation milestone achievement. (2017, 18, 19, 20)** The County must update the report required in section a.iii.2 above each year. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**b.i. Develop an assessment methodology to quantify Mercury load reductions. (2016)** The MRP 2.0 includes a load reduction accounting system based on land-use. The system provides a certain load reduction credit by treating sediment laden stormwater draining from or preventing sediment from mobilizing in areas with Old Industrial, Old Urban, and New Urban/Other land-uses. BASMAA will be developing the assessment methodology based on this accounting system to satisfy this requirement. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

- b.ii. Calculate the Mercury load reduction achieved through the control measures each year. (2017, 18, 19, 20)** The County must calculate the reduction in Mercury load reduction with each of the control measures implemented and operating during the year. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.
- No additional cost for this item.
- b.iii.1. Submit the assessment methodology to the Executive Officer. (2016)** This requirement is being met by BASMAA with no additional cost to the County.
- No additional cost for this item.
- b.iii.2. Provide Mercury load reductions each year in the Annual Report. (2017, 18, 19, 20)** This is included in b.ii above, so there are no additional costs.
- No additional cost for this item.
- b.iii.3 Submit an update of the assessment methodology to the Executive Officer. (2018)** This update will be performed by BASMAA at no additional cost to the County.
- No additional cost for this item.
- c.i. Implement a minimum amount of green infrastructure projects to reduce Mercury loads. (2020)** This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.
- No additional cost for this item.
- c.ii.1 Implement green infrastructure projects to reduce Mercury loads by a specified amount. (2020)** All co-permittees in the County must reduce PCB loads by 9 grams per year by June 30, 2020. The County's share of that (15.26%) is 1.37 grams per year. Each permittee may meet this requirement individually or all co-permittees may meet this requirement collectively with agreement through the Clean Water Program. To meet the Mercury load requirement of 1.37 grams per year would require treating 1.5 acres of Old Industrial land uses or 9.1 acres of Old Urban land uses. The County is required to reduce PCBs by 3.51 grams per year with Green Infrastructure. To meet this PCB load reduction would require treating 58.0 acres of Old Industrial land uses or 165.4 acres of Old Urban land uses. This calculation includes a 70% efficiency factor, which is the default factor approved by the Regional Board. The PCB acreage to meet load reduction targets is much greater

than the Mercury load reduction acreage, so meeting the PCB requirement will also meet the Mercury requirement. As a result, the cost to meet the Mercury requirements for this section is included in the cost to meet the PCB requirements.

- No additional cost for this item.

**c.ii.2. Prepare a reasonable assurance analysis on the effectiveness of Green Infrastructure projects. (2020)** The reasonable assurance analysis must demonstrate how Green Infrastructure will be implemented to achieve load reduction goals by the five counties in the Bay Area with MRP permits, and achieve reductions of at least 10,000 grams per year by 2040. The report must be scientifically rigorous including documentation of all model development, model runs, and required peer review. This analysis and report will be prepared by BASMAA. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.

**c.iii.1. Prepare report on the quantitative relationship between Green Infrastructure and Mercury load reduction. (2018)** This report will be prepared by BASMAA with no additional cost to the County.

- No additional cost for this item

**c.iii.2. Prepare report on amount and characteristics of land area treated by Green Infrastructure. (2020)** This report must estimate the area of land treated by Green Infrastructure and the land-use type of the treatment area for the years 2020, 2030, and 2040. The report will be prepared by BASMAA at no additional cost to the County.

- No additional cost for this item.

**c.iii.3. Submit a reasonable assurance analysis. (2020)** This reporting requirement is included in section C.11.c.ii.2.

- No additional cost for this item.

**c.iii.4. Prepare report on the amount of Mercury removed with Green Infrastructure (2019, 20)** This report must estimate the amount of Mercury load reductions achieved with Green Infrastructure during the term of the permit. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.

- No additional cost for this item.



- d.i. Prepare implementation plan and schedule to achieve TMDL waste-load allocations. (2020)** The County must provide an implementation plan and schedule to implement control measures to meet load reduction requirements and prepare a reasonable assurance analysis that the control measures will attain the TMDL waste-load allocations by 2028. BASMAA will provide an overall framework for the reasonable assurance analysis, but each permittee will have to develop the analysis for their particular control measures. The costs for this provision is included in the more specific requirements outlined below.
- d.ii.1. Identify control measures to be implemented. (2020)** The implementation plan must identify all technically and economically feasible control measures that will be implemented by the County. The reasonable assurance analysis must demonstrate that the control measures will meet the County's proportional share of the TMDL waste-load allocations by 2028. While much of this work will be covered by the requirements in the PCB provision, there will be some additional work needed. This will entail identifying control measures at \$2,000 and preparing the reasonable assurance analysis at \$5,000.
- Identify control measures and perform assurance analysis. \$7,000
- d.ii.2. Develop a schedule to implement control measures. (2020)** The County must develop a schedule to implement the control measures in the implementation plan. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.
- No additional cost for this item.
- d.ii.3. Evaluate overall effectiveness of control measures. (2020)** For each control measure the County must quantify the Mercury load reduction based on field testing results or agreed to equivalencies, identify the capital construction costs and annual maintenance costs, identify any significant environmental impacts resulting from implementation, and develop metrics and calculate efficiencies on a unit basis for comparison purposes. This activity is also required for PCBs and the cost to meet this Mercury provision is included in the PCB costs.
- No additional cost for this item.
- d.iii. Submit the plan and schedule in the 2020 Annual Report.** The cost for this provision is included in the more specific requirements outlined above.
- No additional cost for this item.

**e.i.-iii. Implement a risk reduction program. (2016, 17, 18, 19, 20)** This provision requires development of a risk reduction program to reduce health risks to those people likely to consume fish caught in San Francisco Bay. This was also a requirement of MRP 1.0 and implemented through the Regional Monitoring Program, so there is no additional cost for MRP 2.0.

- No additional cost for this item.

# **POLYCHLORINATED BIPHENYLS (PCBs)**

## **Meeting the PCB Load Reduction Schedule for Unincorporated Contra Costa County A Requirement of the Current Municipal Regional Permit (MRP 2.0)**

**Updated April 10, 2017**

### **I. Objective and Purpose**

The following are the objectives and purpose of the Polychlorinated Biphenyls (PCBs) Load Reduction requirement in the Municipal Regional Permit 2.0:

- Meet the TMDL schedule for San Francisco Bay to remove 3 kg/year by the end of the permit term
- Implement and test a variety of control measures to remove PCBs
- Identify and abate source properties
- Establish PCB management during building demolition activities

The following are observations of the PCB Load Reduction requirements:

- Green Infrastructure is the most favored overall control measure
- Old industrial and old urban land uses are considered the overall primary source of PCBs other than source properties

### **II. PCB Load Reduction Process and Cost**

The following is a step by step process and resultant costs to meet the PCB Load Reduction requirements specified in the Municipal Regional Permit 2.0. This cost analysis is based on the assumption that the County must meet its own PCB load reduction targets. This presumes that Bay Area permittees, collectively, are not able to meet the overall TMDL goal and the requirement devolves to the counties, and that Contra Costa County permittees, collectively, are also not able to meet load reduction targets.:

#### Provision C.12: Reducing PCB Levels in the Bay

##### **a.i. Implement control measures to reduce PCBs. (2018, 2020)**

All co-permittees within Contra Costa County must reduce PCB loads by 90 grams per year by 2018 and 560 grams per year by 2020. The 90 gram load reduction in 2018 is carried forward, so the 560 gram load reduction in 2020 includes the 2018 load reduction, leaving a balance of 470 grams.

The County's share of that load reduction, based on population as of January 2015, is 15.26%. The County must therefore implement source and treatment control measures to reduce PCBs by 13.73 grams per year by 2018 and a total of 85.45 grams per year by 2020.

The cost to implement the control measures identified in this provision is covered in the provisions outlining the specific control measure.

- No additional cost for this item

**a.ii.1 Identify current and proposed watersheds or management areas with control measures. (2016)** The County must identify the watersheds or management areas (portions of watersheds) where PCB control measures are currently being implemented and where new control measures will be implemented. This will entail identifying where control measures are currently being implemented at \$1,000, and analyzing and identifying where new control measures can be implemented at \$10,000.

- Identify watersheds/management areas with control measures. \$11,000

**a.ii.2. Identify current and new control measures. (2016)** The County must identify the various types of control measures that are currently being implemented (primarily street sweeping) and control measures that will be implemented. PCB molecules attach themselves to sediment particles, so control measures that settle out or capture sediment particles are most effective. Control measures can include abating "source properties" (properties where PCBs were stored or used in industrial processes), constructing green infrastructure treatment facilities, sweeping streets in management areas, cleaning drainage inlets, redeveloping and remediating contaminated areas, diverting stormwater to sewer treatment plants, flushing streets, and managing debris during building demolition and renovation. This will entail identifying the various types of current control measures being used and analyzing and determining what type of control measure would be most appropriate in the new management areas. These costs are included in C.12.a.ii.1 above.

**Note:** The County is proposing four control measures, 1) identifying source properties throughout the unincorporated County and referring them to the Regional Board, 2) developing a large scale treatment project in the North Richmond Pump Station drainage, 3) construct curb and gutter where none now exists to facilitate street sweeping in and around Old Industrial areas, and 4) construct Green Infrastructure projects throughout the unincorporated County.

- There is no additional cost for this item



- a.ii.3. Develop implementation schedule. (2016, 17, 18, 19, 20)** The County must develop a schedule to implement new control measures at \$10,000, and update it as necessary each year at \$1,000 per year.
- Develop implementation schedule. \$10,000
  - Annual cost to update schedule. \$1,000

- a.ii.4. Implement control measures to meet load reduction requirements. (2018, 2020)** The County must implement control measures to reduce PCBs by 13.73 grams by 2018 and a total of 85.45 grams by 2020. It is assumed the County will avail itself of the 67% load reduction credit for implementing a demolition control program in 2019, leaving a 33% load reduction balance of 28.48 grams by 2020 (reduced from 85.45 grams). The 67% credit goes into effect in 2019, so the 2018 load reduction requirement of 13.73 grams is not reduced. In addition, provision C.12.c.ii.1 requires a minimum of 3.51 grams of the total 2020 load reduction through Green Infrastructure.

The load reduction calculation is based on the land-use type of the drainage area flowing to the control measure. Treating sediment laden stormwater draining from, or preventing sediment from mobilizing in, areas with Old Industrial land uses yields a load reduction of 0.0865 grams per acre per year, while Old Urban land uses yields 0.0303 grams per acre per year, New Urban land uses yields 0.0035 grams per acre per year, and Open Space land uses yields 0.0043 grams per acre per year. "Old" land use areas are those generally constructed before 1980 and "New" are those areas constructed after 1980. To meet the total load requirement of 28.48 grams through treatment only would require treating 329 acres of Old Industrial land uses, 940 acres of Old Urban land uses, 8137 acres of New Urban land uses, or 6623 acres of Open Space land uses. Based on the load reduction yields per acre, it makes sense to focus on areas with Old Industrial and Old Urban land uses.

The County is proposing four control measures to meet PCB load reduction requirements as follows:

**Source Properties.** This measure would identify properties with very high concentrations of PCBs due to historic uses of the property. The County could then proceed to abate the PCBs or refer the property to the Regional Board for investigation and abatement. If the property is referred to the Regional Board, the County must submit a plan with the referral that describes how the County will prevent PCBs from leaving the site, or from entering the storm drain system. The County would receive 50% of the load reduction credit for properties referred to the Regional Board upon referral, and the remaining 50% credit would be received upon completion of the abatement. If the County abates the property, 100% of the load reduction would be credited upon completion. Abatement projects can take many years. The load reduction credit for

these types of properties is 4.035 grams per acre per year, substantially more than the credit for Old Industrial land uses! A one-acre site referred to the Regional Board each year could result in about 2 grams credit. To implement this control measure the County would need to identify potential parcels for testing at \$10,000, and conduct field testing to determine if there are excessive levels of PCBs at \$25,000. If a parcel is identified and assuming it will be referred to the Regional Board, then the County would need to prepare a referral letter with documentation at \$10,000, develop a containment plan to prevent PCBs from entering the storm drain system at \$10,000, implement the containment project at \$25,000, and maintain the containment feature at \$10,000 per year. The County has been looking at properties in likely areas but has only discovered one potential site, so it is assumed this control measure will only yield 1.0 grams per year.

Cost for possibly 1.0 gram of PCBs. \$80,000

Annual cost to maintain containment features. \$10,000

**North Richmond Pump Station.** This measure would divert dry weather flows to the West County Wastewater District to remove PCB laden sediments from stormwater runoff. In addition, first flush wet weather events would be diverted for treatment. The County conducted a pilot stormwater diversion project at the North Richmond Pump Station in 2015. That project resulted in 0.00064 grams of PCBs removed in 9.5 work-days (eight hour days), and 0.00084 grams of PCBs removed in one wet weather first flush event. Assuming the Pump Station can divert dry weather type flows for treatment 330 days per year and divert five first flush wet weather events per year, the PCB load reduction would be 0.0262 grams per year. To implement this control measure the County would need to install a permanent connection from the Pump Station to the Wastewater District manhole in Gertrude Avenue at \$50,000, negotiate a permit/agreement with the Wastewater District to treat the diverted flows at \$10,000, and pay a connection fee to the Wastewater District at \$15,000. Load reductions could be increased by doubling the discharge rate to 200 gallons per minute and operating 24 hours per day for 330 days per year. This would increase load reduction to 0.137 grams per year, but would likely require increased testing equipment to safeguard the Wastewater District treatment process at \$25,000 and likely double the connection fee to \$30,000. This project would only be financially feasible if there were no treatment charges for the roughly 95,000,000 gallons diverted to the treatment plant each year. The project would be feasible if the diverted stormwater was viewed as a resource in conjunction with some other re-use project allowing treatment costs to be paid from other sources. To develop this type of re-use project would likely take a year or two to negotiate. Further load reduction increases could be achieved by modifying the Pump Station to maximize flows to the Wastewater District by adding a storage component to capture all flows yet not exceed the capacity of the Wastewater District pipe system. This

would be an expensive project and one not contemplated during this permit term.

One time capital cost for 0.0262 grams of PCBs per year. \$75,000

One time capital cost for 0.137 grams of PCBs per year. \$115,000

Annual cost to treat 95 million gallons. \$Unknown

**Enhanced Street Sweeping.** This measure would construct curb and gutter in and around Old Industrial land uses where none currently exist, allowing sediment to be picked up by street sweeping. Street sweeping is not effective without curb and gutter. To implement this control measure the County would need to identify areas with Old Industrial land uses where installing curb and gutter would be feasible at \$25,000, developing and building a project to install curb and gutter along 10 blocks (200 feet long blocks) at \$90 per lineal foot (curb and gutter plus 18 inches of pavement), assuming no drainage work is necessary (big assumption), and conducting additional street sweeping at \$50,000 per year. The capital project to implement this control measure would take two years to plan and build. It is assumed this control measure will yield 1.0 grams of PCBs.

Develop feasibility analysis. \$25,000

Capital cost for 1.0 grams of PCBs. \$180,000

Annual cost of Street sweeping. \$50,000

**Green Infrastructure.** This measure would construct Green Infrastructure projects, mostly in areas with Old Industrial and Old Urban land uses. Projects in Old Industrial areas would be located where installation of curb and gutter was not feasible but conversion of an existing roadside ditch to a bio-retention facility would work. Both public and private Green Infrastructure projects count in calculating the load reduction. It is assumed that private projects will be able to treat 10 acres per year of a mix of Old Industrial and Old Urban land use, with an equivalent load reduction of 0.5 grams per year in 2016, 2017, 2018, 2019, and 2020. This would entail identifying all Green Infrastructure projects proposed by developers, determining the land-use category and area draining to the Green Infrastructure project, and tracking other information required by the Load Reduction Calculator at \$5,000 per year. The County would need to meet the balance of its requirements by implementing Green Infrastructure projects on public property. This would entail identifying the target acreage needed to be treated in Old Industrial or Old Urban land use areas and developing projects to treat the drainage area at a unit treatment cost of \$215,000 per acre (based on the 255 Glacier Drive Parking Lot bio-retention project that treated 1.35 acres at a cost of \$290,000) and an annual maintenance cost of \$3,000 per treated acre. Given the assumptions with the other control measures of 1.0 grams from Source Properties, 0.14 grams from the Pump Station,

1.0 grams from Street Sweeping, and 0.5 grams per year from private Green Infrastructure projects, the public Green Infrastructure project component will have to yield load reductions of 10.09 (13.73 – 3.64) grams in 2018, and 17.39 grams in 2020. The overall 2020 load reduction (28.48) is reduced by the 2018 load reduction (10.09) to determine the balance of load reduction requirement in 2020 (17.39) including private development in 2019 (0.5) and 2020 (0.5). To meet the load reduction requirement of 10.09 grams in 2018 would require treating 116.6 acres of Old Industrial land use area or 333.0 acres of Old Urban land use area. It is assumed 225 acres of a mix of these two land uses will be treated to meet the requirement. This acreage would be multiplied by the treatment cost of \$215,000 per treated acre and reduced by the 70% efficiency factor for Green Infrastructure approved by the Regional Board. Using the same methodology to determine the load reduction requirement costs for 2020, it is assumed that the contribution from private projects will hold steady at 10 acres per year with a load reduction of 0.5 grams per year, so the balance of 17.39 grams will have to be picked up with public Green Infrastructure retrofit projects. The cost to the County would be treating approximately 390 acres of mixed land-use at a unit treatment cost of \$215,000 per acre with a 70% efficiency factor, and an annual maintenance cost of \$3,000 per treated acre. This would represent the worst case cost scenario using the assumptions noted above.

**Note:** The permit allows implementation collaboratively with other jurisdictions within the County or within the region, which may reduce unit costs.

It should also be noted these costs were peer-reviewed by a consultant in the stormwater field. The consultant indicated costs to construct Green Infrastructure in the Bay Area to treat 1 acre of drainage ranges from \$200,000 up to \$365,000. This report used a cost of \$215,000 per acre, based on a Public Works Department project, which is at the low end of the range. More recent work by the same consultant indicates that average costs in Southern California are about \$110,000 per treated acre. However, since there are enough differences in soils, climate, and institutional arrangements between there and the Bay Area, this analysis continues to use \$215,000 per treated acre.

- Implement control measures (2018). \$69,100,000
- Implement control measures (2020). \$119,800,000
- Annual cost to track private Green Infrastructure projects. \$5,000
- Annual maintenance costs (2018). \$675,000
- Annual maintenance costs (2019). \$675,000
- Annual maintenance costs (2020). \$1,845,000

**a.iii.1. Develop a Progress Report on implementation of control measures. (2016)** The County must develop a progress report by April 2016 outlining the steps taken to develop a list of watersheds, identify

control measures, justify the selection of watersheds using monitoring data, and report on contamination sites referred to the Regional Board at \$5,000.

- Develop Progress Report. \$5,000

**a.iii.2. Develop an implementation status report for each Annual Report. (2017, 18, 19, 20)** The County must develop a status report each year that includes the number, type, and location of control measures (included in C.12.a.ii.2), the cumulative listing of all PCB contaminated sites referred to the Regional Board (included in C.12.a.ii.2), the description, scope, and start date of the control measures plus implementation progress milestones and schedule for milestone achievement (partially included in C.12.a.ii.2 and C.12.a.ii.3), and indicate the roles and responsibilities of each participating co-permittee where multiple jurisdictions are involved all at \$3,000.

- Annual cost to do the status report for the Annual Report. \$3,000

**a.iii.3. Annual updates of control measures, sites referred to the Regional Board, and implementation milestone achievement. (2017, 18, 19, 20)** The County must update the report required in section C.12.a.iii.2 above each year. This cost is included in the provision C.12.a.iii.2 above.

- No additional cost for this item.

**a.iii.4. Develop alternative load reduction distribution criteria (optional). (2017)** The County must identify and document an alternative method of distributing load reductions within the County, only if it chooses to do so. This would be done in conjunction with all co-permittees within the Clean Water Program. The current method of load reduction distribution is based on the proportional population of each co-permittee within the County, and there is no reason to believe an alternate method would be needed or desired.

- There is no additional cost for this item, unless an alternative load reduction distribution is needed. Developing an alternative load reduction distribution criteria would cost approximately \$25,000.

**b.i. Develop an assessment methodology to quantify PCB load reductions. (2016)** The MRP 2.0 includes a load reduction accounting system based on land-use. The system provides a certain load reduction credit by treating sediment laden stormwater draining from or preventing sediment from mobilizing in areas with Old Industrial, Old Urban, New Urban, and Open Space land-uses. BASMAA will be developing the assessment methodology based on this accounting system to satisfy this



requirement. The work has been included in this year's BASMAA budget so no additional costs from the County will be needed.

- No additional cost for this item

**b.ii. Calculate the PCB load reduction achieved through the control measures each year. (2017, 18, 19, 20)** The County must calculate the reduction in PCB load reduction with each of the control measures implemented and operating during the year. BASMAA is developing a Permittee Load Reduction Credit Calculator to facilitate this calculation. The County will receive a 67% load reduction credit if it implements a program to manage building and construction demolition debris containing PCBs (provision C.12.f). Meeting this requirement will entail gathering the specified data and entering it into the Load Reduction Calculator at \$5,000 per year.

- Annual calculation of PCB load reduction. \$5,000

**b.iii.1. Submit the assessment methodology to the Executive Officer. (2016)** This requirement is being met by BASMAA with no additional cost to the County.

- No additional cost for this item

**b.iii.2. Provide PCB load reductions each year in the Annual Report. (2017, 18, 19, 20)** This is included in C.12.b.ii above, so there are no additional costs.

- No additional cost for this item

**b.iii.3 Submit an update of the assessment methodology to the Executive Officer. (2018)** This update will be performed by BASMAA at no additional cost to the County.

- No additional cost for this item.

**b.iii.4 Develop alternative load reduction distribution criteria (optional). (2019)** This provision is similar to C.12.a.iii.4, except the load reduction distribution alternative is specifically for implementing a PCB containment program for demolition debris.

- There is no additional cost for this item, unless an alternative load reduction distribution is needed. Developing and alternative load reduction distribution criteria would cost approximately \$25,000.

**c.i. Implement a minimum amount of green infrastructure projects to reduce PCB loads. (2020)** The cost for this provision is included in the more specific requirements outlined below.

**c.ii.1 Implement green infrastructure projects to reduce PCB loads by a specified amount. (2020)** All co-permittees in Contra Costa County must use Green Infrastructure to reduce PCB loads by 23 grams by June 30, 2020. The County's share of that (15.26%) is 3.51 grams. Each co-permittee may meet this requirement individually or all co-permittees may meet this requirement collectively with agreement through the Clean Water Program. To meet the load requirement of 3.51 grams per year would require treating 40.6 acres of Old Industrial land uses or 115.8 acres of Old Urban land uses. It is assumed 78 acres of a mix of these two land uses will be treated to meet the requirement. To calculate the total cost, this acreage would be multiplied by \$215,000 per treated acre with a 70% default efficiency factor approved by the Regional Board. These acreage quantities are significantly below those proposed in the Green Infrastructure Section of provision C.12.a.ii.4, so this requirement is covered in that prior section.

- There is no additional cost for this item.

**c.ii.2. Prepare a reasonable assurance analysis on the effectiveness of Green Infrastructure projects. (2020)** The reasonable assurance analysis must demonstrate how Green Infrastructure will be implemented to achieve a load reduction of 3.0 kilograms by the five counties in the Bay Area with MRP permits. The report must be scientifically rigorous including documentation of all model development, model runs, and required peer review. This analysis and report will be prepared by BASMAA and will be included in their annual budget over the next two or three years, so there will be no additional cost to the County. There will be some coordination effort and review time required of County staff to ensure County needs are met at \$2,000.

- Cost to coordinate with the reasonable assurance analysis. \$2,000

**c.iii.1. Prepare report on the quantitative relationship between Green Infrastructure and PCB load reduction. (2018)** This report will be prepared by BASMAA with no additional cost to the County.

- No additional cost for this item

**c.iii.2. Prepare report on amount and characteristics of land area treated by Green Infrastructure. (2020)** This report must estimate the area of land treated by Green Infrastructure and the land-use type of the treatment area for the years 2020, 2030, and 2040. The report will be prepared by BASMAA at no additional cost to the County, however, the County will need to coordinate with and provide data to BASMAA for the report at \$5,000.

- Provide information for report. \$5,000

- c.iii.3. Submit a reasonable assurance analysis. (2020)** This reporting requirement was included in section C.12.c.ii.2.
- c.iii.4. Prepare report on the amount of PCBs removed with Green Infrastructure (2019, 20)** This report must estimate the amount of PCB load reductions achieved with Green Infrastructure during the term of the permit. This will entail analyzing test results and calculating load reductions at \$2,000 per year.
- Annual cost for report on load reduction. \$2,000
- d.i. Prepare implementation plan and schedule to achieve TMDL waste-load allocations. (2020)** The County must provide an implementation plan and schedule to implement control measures to meet load reduction requirements and prepare a reasonable assurance analysis that the control measures will attain the TMDL waste-load allocations by 2030. BASMAA will provide an overall framework for the reasonable assurance analysis, but each permittee will have to develop the analysis for their particular control measures. The costs for this provision is included in the more specific requirements outlined below.
- d.ii.1. Identify control measures to be implemented. (2020)** The implementation plan must identify all technically and economically feasible control measures that will be implemented by the County. The reasonable assurance analysis must demonstrate that the control measures will meet the County's proportional share of the TMDL waste-load allocations by 2030. This will entail identifying the control measures at \$5,000 and preparing the reasonable assurance analysis at \$15,000.
- Identify control measures and perform assurance analysis. \$20,000
- d.ii.2. Develop a schedule to implement control measures. (2020)** The County must develop a schedule to implement the control measures in the implementation plan at \$5,000.
- Develop implementation schedule. \$5,000
- d.ii.3. Evaluate overall effectiveness of control measures. (2020)** BASMAA will assist the counties by developing a framework to guide this work. However, for each control measure the County must quantify the PCB load reduction based on field testing results or agreed to equivalencies at \$2,000, identify the capital construction costs and annual maintenance costs at \$2,000, identify any significant environmental impacts resulting from implementation at \$2,000, and develop metrics and calculate efficiencies on a unit basis for comparison purposes at \$10,000.
- Evaluate the effectiveness of control measures. \$16,000

- d.iii. Submit the plan and schedule in the 2020 Annual Report.** The cost for this provision is included in the more specific requirements outlined above.
- e.i.-iii. Evaluate PCBs in public infrastructure facilities. (2018)** This provision requires collection of caulk samples from sealants in storm drain facilities, between concrete curbs and street pavement, and other infrastructure to determine the amount of PCBs present in the caulking materials. BASMAA will be collecting the samples, performing the analysis, and preparing the report to meet this requirement at no additional cost to the County. There will be some coordination effort and review time required of County staff to ensure County needs are met at \$2,000.
- Cost to coordinate with evaluation study. \$2,000
- f.i. Manage demolition debris to prevent PCBs from entering storm drain systems.** This provision requires development of a program to manage PCB laden materials with concentrations of 50 ppm or greater during the demolition of buildings to prevent pollutants from entering the storm drain system. This requires preventing mobilization and transport of PCBs through vehicle track out, airborne releases, soil erosion, or stormwater runoff. This requirement applies to commercial, public, institutional, and industrial structures, but does not apply to single-family residential or wood-frame structures. The costs for this provision is included in the more specific requirements outlined below.
- f.ii.1. Develop demolition debris management protocols. (2019)** The County must demonstrate it has the necessary authority to require management of PCBs during the demolition of applicable structures, a method for identifying the applicable structures within the County's jurisdiction, and management methods to ensure PCBs are not discharged to the storm drain system. BASMAA will prepare a model ordinance and develop a range of acceptable sample protocols for managing construction debris during demolition activities at no additional cost to the County. This will entail adapting the model ordinance to County format at \$5,000, shepherding the prospective ordinance through the County review and approval process at \$10,000, developing a mechanism to flag parcels with applicable buildings in the permit database at \$25,000, and adapting the sample management protocols to the County's business procedures and incorporating them into the permit process at \$5,000.
- Develop debris management protocols. \$45,000
- f.ii.2. Implement demolition debris management protocols. (2019)** The County must incorporate debris management protocols into its permit and inspection system. Most of the cost for this provision is included in

section C.12.f.ii.1 above. This will require training of office staff and field inspectors on the new protocols at \$5,000.

- Implement debris management protocols. \$5,000

**f.ii.3. Develop assessment methods to determine effectiveness of demolition debris management protocols. (2019)** This provision requires development of an assessment methodology and data collection program to determine the effectiveness of managing demolition debris to reduce PCB loads. BASMAA will be developing the assessment methodology and data collection program, and preparing the report to meet this requirement at no cost to the County.

- No additional cost for this item

**Note:** It should be noted here that BASMAA will be taking on a significant amount of technical studies to support permittees in meeting MRP 2.0 requirements. At this time it is assumed that all this work can be accomplished with no increase in the annual "dues". However, due to the complexity and amount of work involved with MRP 2.0 an increase in the annual dues to BASMAA would seem likely, resulting in a proportional cost increase to the County.

**f.iii.1. Prepare annual status report on implementing demolition debris management protocols. (2016, 17, 18)** The County must report on efforts to implement debris management protocols, such as developing ordinances and implementation policies and procedures, obtaining information needed for the various studies, incorporation of this requirement into business practices and processes, and training at \$2,000 each year.

- Annual cost to provide status report. \$2,000

**f.iii.2. Prepare exemption justification. (2017)** This applies only to jurisdictions requesting an exemption from these requirements, which the County does not qualify for.

- No additional cost for this item

**f.iii.3. Prepare status reports on implementing demolition debris management protocols. (2020)** This provision requires the County to document how it has met the minimum requirements for implementing debris management protocols at \$2,000.

- Implementation status report. \$2,000



**f.iii.4. Prepare report on applicable buildings. (2020)** This provision requires the County to track and report on the number of applicable buildings issued a demolition permit each year, a running list of total permits, and description of PCB control measures used. This will entail developing a tracking system for demolition permits with the control measures used at \$10,000 and extracting the information and reporting out at \$1,000.

- Prepare reports on applicable buildings. \$11,000

**f.iii.5. Develop assessment methods to determine quantity of PCBs removed with demolition debris management protocols. (2020)**

This provision requires development of an assessment methodology and data collection program to determine the quantities of PCBs removed by managing demolition debris. BASMAA will be developing the assessment methodology and data collection program, and preparing the report to meet this requirement at no cost to the County.

- No additional cost for this item

**g.i.-iii. Develop a fate and transport study of PCBs. (2017, 18, 20)** This provision requires development of a fate and transport study describing biological uptake of PCBs in the San Francisco Bay margins. This study will be developed by the San Francisco Estuary Institute at no additional cost to the County.

- No additional cost for this item

**h.i.-iii. Implement a risk reduction program. (2016, 17, 18, 19, 20)** This provision requires development of a risk reduction program to reduce health risks to those people likely to consume fish caught in San Francisco Bay. This was also a requirement of MRP 1.0 and implemented through the Regional Monitoring Program, so there is no additional cost for MRP 2.0.

- No additional cost for this item

**Appendix Table 1. MRP 2.0 Additional Provision Costs: C.3 Green Infrastructure Cost Summary**

<b>Provision Number</b>	<b>Requirement</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
C.3.j.i.1	Prepare Green Infrastructure Plan framework	\$0	\$34,500	\$0	\$0	\$0
C.3.j.i.2.a	Develop mechanism to map and prioritize GI projects on a watershed basis	\$0	\$0	\$0	\$216,000	\$0
C.3.j.i.2.b	Outputs from mapping and prioritization mechanism (see C.3.j.i.2.a)	\$0	\$0	\$0	\$0	\$0
C.3.j.i.2.c	Develop urban built environment retrofit targets	\$0	\$0	\$0	\$20,000	\$0
C.3.j.i.2.d	Develop process to track and map completed GI projects	\$0	\$0	\$0	\$2,000	\$2,000
C.3.j.i.2.e	Develop guidelines for project development, design, and construction to ensure GI is included in projects	\$0	\$0	\$0	\$20,000	\$0
C.3.j.i.2.f	Prepare standard specifications and standard plans	\$0	\$0	\$0	\$40,000	\$0
C.3.j.i.g	Develop options to include hydro-modification in GI projects	\$0	\$0	\$0	\$55,000	\$0
C.3.j.i.2.h	Update County's foundational planning documents	\$0	\$0	\$0	\$250,000	\$0
C.3.j.i.2.i	Develop work-plan to ensure GI and LID measures are included in future planning document amendments	\$0	\$0	\$0	\$25,000	\$0
C.3.j.i.2.j	Develop work-plan to complete prioritized GI projects	\$0	\$0	\$0	\$125,000	\$0
C.3.j.i.2.k	Develop a GI Financing Plan	\$0	\$0	\$0	\$25,000	\$0
C.3.j.i.3	Develop and adopt policies, ordinances to ensure GI Plan implementation	\$0	\$0	\$0	\$45,000	\$0
C.3.j.i.4.a	Conduct public outreach on the GI Plan	\$0	\$11,000	\$11,000	\$11,000	\$11,000
C.3.j.i.4.b	Provide staff training on the GI Plan	\$0	\$6,000	\$3,000	\$3,000	\$3,000
C.3.j.i.4.c	Educate County elected officials on the GI Plan	\$0	\$5,000	\$2,000	\$2,000	\$2,000
C.3.j.i.5	Progress report on GI planning	\$0	\$5,000	\$5,000	\$5,000	\$5,000
C.3.j.ii.1	Prepare and maintain a list of public and private GI projects	\$0	\$12,000	\$2,000	\$2,000	\$2,000
C.3.j.ii.2	Prepare a status summary for each public and private GI project	\$0	\$6,000	\$6,000	\$6,000	\$6,000
C.3.j.iii.1	Influence regional, state, and federal agencies to fund and incorporate GI measures	\$0	\$5,000	\$5,000	\$5,000	\$5,000
C.3.j.iii.2	Report on participation goals	\$0	\$5,000	\$5,000	\$5,000	\$5,000
C.3.j.iii.3	Prepare a plan and schedule for GI advocacy efforts	\$0	\$0	\$0	\$5,000	\$0
C.3.j.iv.1	Develop regionally consistent tracking method for GI	\$0	\$0	\$0	\$20,000	\$0
C.3.j.iv.2	Report progress on tracking methods each year	\$0	\$2,000	\$2,000	\$2,000	\$2,000
C.3.j.iv.3	Submit tracking methods and status in 2019 Annual Report (see j.iv.1)	\$0	\$0	\$0	\$0	\$0
<b>Total Costs</b>		<b>\$0</b>	<b>\$91,500</b>	<b>\$41,000</b>	<b>\$889,000</b>	<b>\$43,000</b>

**Appendix Table 2. MRP 2.0 Additional Provision Costs: C.10 Trash Load Reduction Costs Summary**

Provision Number	Requirement	Estimated Costs				
		2016	2017	2018	2019	2020
C.10.a.i.	Meet prescribed schedule	\$25,000	\$0	\$25,000	\$0	\$0
a.i.	Meet trash reduction targets: Full trash capture devices	\$0	\$840,000	\$1,380,000	\$1,890,000	\$2,710,000
a.i.	Meet trash reduction targets: On-land clean-up	\$0	\$200,000	\$200,000	\$200,000	\$200,000
a.i.	Meet trash reduction targets: Community-based measures	\$5,000	\$25,000	\$10,000	\$10,000	\$10,000
a.i.	Meet trash reduction targets: Direct discharge control (See e.ii)	\$0	\$0	\$0	\$0	\$0
a.ii.	Update trash generation areas	\$25,000	\$0	\$0	\$0	\$0
a.ii.a.	Establish full trash capture systems as the standard	\$0	\$0	\$0	\$0	\$0
a.ii.b.	Private storm drains to include full trash capture	\$0	\$0	\$160,000	\$0	\$0
a.iii.	Install minimum full trash capture systems (In MRP 1.0)	\$0	\$0	\$0	\$0	\$0
b.i.a.	Maintenance Plan for full trash capture devices	\$0	\$35,000	\$0	\$0	\$0
b.i.b.	Report on effectiveness of full trash capture devices	\$0	\$3,000	\$3,000	\$3,000	\$3,000
b.i.c.	Certification of full trash capture systems	\$0	\$1,000	\$1,000	\$1,000	\$1,000
b.ii.a.	Document other trash management actions	\$0	\$25,000	\$0	\$0	\$0
b.ii.b.	Effectiveness of other trash management actions	\$0	\$0	\$0	\$50,000	\$0
b.iii.	Calculate trash discharge reduction	\$0	\$5,000	\$5,000	\$5,000	\$5,000
b.iv.	Develop source control strategy	\$0	\$85,000	\$10,000	\$10,000	\$10,000
b.v.	Develop receiving water monitoring program	\$0	\$0	\$10,000	\$5,000	\$5,000
c.	Clean-up trash hotspots (In MRP 1.0)	\$0	\$0	\$0	\$0	\$0
d.	Update Trash Load Reduction Plan (see C.10.a.i)	\$0	\$0	\$0	\$0	\$0
e.i.	Evaluate creek/shoreline cleanups as a control measure	\$0	\$25,000	\$5,000	\$5,000	\$5,000
e.ii.	Evaluate direct trash discharge control measures	\$0	\$250,000	\$205,000	\$205,000	\$205,000
f.v.b.	Prepare non-compliance report (If necessary) (see Note 1)					
<b>Total Costs</b>		<b>\$55,000</b>	<b>\$1,494,000</b>	<b>\$2,014,000</b>	<b>\$2,384,000</b>	<b>\$3,154,000</b>

**Notes:**

1. If County does not meet the 70% load reduction by 2017 or 80% load reduction by 2018, then the County would convert drainage inlets in the non-attainment area to full trash capture. This would result in a planning cost of \$75,000 in 2017, an implementation cost of \$2,440,000 in 2018, and \$3,100,000 annual increase in maintenance costs.



**Appendix Table 3. MRP 2.0 Additional Provision Costs: C.12 PCB Load Reduction Cost Summary**

Provision Number	Requirement	2016	2017	2018	2019	2020
C.12.a.i.	Implement PCB control measures	\$0	\$0	\$0	\$0	\$0
a.ii.1	Identify management areas with control measures	\$11,000	\$0	\$0	\$0	\$0
a.ii.2.	Identify current and new control measures (see C.12	\$0	\$0	\$0	\$0	\$0
a.ii.3.	Develop implementation schedule	\$10,000	\$1,000	\$1,000	\$1,000	\$1,000
a.ii.4.	Implement Source Properties control measure	\$0	\$0	\$80,000	\$10,000	\$10,000
a.ii.4.	Implement North Richmon Pump Station control measure	\$0	\$0	\$0	\$0	\$115,000
a.ii.4.	Implement Street Sweeping control measure	\$0	\$0	\$25,000	\$180,000	\$50,000
a.ii.4.	Implement Green Infrastructure control measure	\$0	\$0	\$69,780,000	\$680,000	\$121,650,000
a.iii.1.	Progress report on control measures	\$5,000	\$0	\$0	\$0	\$0
a.iii.2.	Develop status for each Annual Report	\$0	\$3,000	\$3,000	\$3,000	\$3,000
a.iii.3.	Update on control measures, source properties, milestones (see C.12.a.iii.2)	\$0	\$0	\$0	\$0	\$0
a.iii.4.	Alternative load reduction distribution (optional) (see Note 1)					
b.i.	Develop load reduction assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.ii.	Calculate PCB load reduction each year	\$0	\$5,000	\$5,000	\$5,000	\$5,000
b.iii.1.	Submit assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.2.	Provide PCB load reductions each year (included in C.12.b.ii)	\$0	\$0	\$0	\$0	\$0
b.iii.3	Update assessment methodology (BASMAA)	\$0	\$0	\$0	\$0	\$0
b.iii.4	Alternative load reduction distribution (optional) (see Note 1)					
c.i.	Minimum GI projects for PCBs (see C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.1	Implement GI projects for specified reduction (included in C.12.a.ii.4)	\$0	\$0	\$0	\$0	\$0
c.ii.2.	Reasonable assurance analysis on GI projects (BASMAA)	\$0	\$0	\$0	\$0	\$2,000
c.iii.1.	Report on GI and PCB load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0
c.iii.2.	Report on land area treated by GI (BASMAA)	\$0	\$0	\$0	\$0	\$5,000



**Appendix Table 3. MRP 2.0 Additional Provision Costs: C.12 PCB Load Reduction Cost Summary**

Provision Number	Requirement	2016	2017	2018	2019	2020
c.iii.3.	Submit a reasonable assurance analysis (included in C.12.c.ii.2)	\$0	\$0	\$0	\$0	\$0
c.iii.4.	Report on PCBs removed with GI	\$0	\$0	\$0	\$2,000	\$2,000
d.i.	Implementation plan for TMDL waste-load allocations (see C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
d.ii.1.	Identify control measures	\$0	\$0	\$0	\$0	\$20,000
d.ii.2.	Implement control measures	\$0	\$0	\$0	\$0	\$5,000
d.ii.3.	Evaluate effectiveness of control measures	\$0	\$0	\$0	\$0	\$16,000
d.iii.	Submit implementation plan (included in C.12.d.ii.1)	\$0	\$0	\$0	\$0	\$0
e.i.-iii.	Evaluate PCBs in public infrastructure facilities (BASMAA)	\$0	\$0	\$2,000	\$0	0
C.12.f.i.	Manage demolition debris to contain PCBs (see C.12.f.ii.1)	\$0	\$0	\$0	\$0	\$0
f.ii.1.	Develop debris management protocols	\$0	\$0	\$0	\$45,000	\$0
f.ii.2.	Implement debris management protocols	\$0	\$0	\$0	\$5,000	\$0
f.ii.3.	Assessment of debris management effectiveness (BASMAA)	\$0	\$0	\$0	\$0	\$0
f.iii.1.	Report on implementing debris management	\$2,000	\$2,000	\$2,000	\$0	\$0
f.iii.2.	Prepare exemption justification (not applicable)					
f.iii.3.	Report on debris management protocols	\$0	\$0	\$0	\$0	\$2,000
f.iii.4.	Report on applicable buildings	\$0	\$0	\$0	\$0	\$11,000
f.iii.5.	Assessment methodology for load reduction (BASMAA)	\$0	\$0	\$0	\$0	\$0
g.i.-iii.	Fate and transport study (SFEI)	\$0	\$0	\$0	\$0	\$0
h.i.-iii.	Risk reduction program (included in MRP 1.0)	\$0	\$0	\$0	\$0	\$0
<b>Total Costs</b>		<b>\$28,000</b>	<b>\$11,000</b>	<b>\$69,898,000</b>	<b>\$931,000</b>	<b>\$121,897,000</b>

**Note:**

1. The current distribution method of load reduction within the county is based on the proportional population of each co-permittee. If the Clean Water Program decided to develop an alternative distribution methodology, the estimated cost would



**Appendix Table 4. MRP 2.0 Additional Provision Costs: Mercury Load Reduction Cost Summary**

<b>Provision Number</b>	<b>Requirement</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
a.i.	Implement Mercury control measures (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.ii.1	Identify management areas with control measures (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.ii.2.	Identify current and new control measures (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.ii.3.	Develop implementation schedule (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.ii.4.	Implement Green Infrastructure control measure (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.iii.1.	Progress report on control measures (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.iii.2.	Develop status for each Annual Report (see Note 1)	\$0	\$0	\$0	\$0	\$0
a.iii.3.	Update on control measures, source properties, milestones (see Note 1)	\$0	\$0	\$0	\$0	\$0
b.i.	Develop load reduction assessment methodology (BASMAA) (see Note 1)	\$0	\$0	\$0	\$0	\$0
b.ii.	Calculate Mercury load reduction each year (see Note 1)	\$0	\$0	\$0	\$0	\$0
b.iii.1.	Submit assessment methodology (BASMAA) (see Note 1)	\$0	\$0	\$0	\$0	\$0
b.iii.2.	Provide Mercury load reductions each year (included in b.ii) (see Note 1)	\$0	\$0	\$0	\$0	\$0
b.iii.3	Update assessment methodology (BASMAA) (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.i.	Minimum GI projects for Mercury (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.ii.1	Implement GI projects for specified reduction (included in a.ii.4) (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.ii.2.	Reasonable assurance analysis on GI projects (BASMAA) (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.iii.1.	Report on GI and Mercury load reduction (BASMAA) (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.iii.2.	Report on land area treated by GI (BASMAA) (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.iii.3.	Submit a reasonable assurance analysis (included in c.ii.2) (see Note 1)	\$0	\$0	\$0	\$0	\$0
c.iii.4.	Report on Mercury removed with GI (see Note 1)	\$0	\$0	\$0	\$0	\$0
d.i.	Implementation plan for TMDL waste-load allocations (see Note 1)	\$0	\$0	\$0	\$0	\$0
d.ii.1.	Identify control measures	\$0	\$0	\$0	\$0	\$7,000
d.ii.2.	Implement control measures (see Note 1)	\$0	\$0	\$0	\$0	\$0
d.ii.3.	Evaluate effectiveness of control measures (see Note 1)	\$0	\$0	\$0	\$0	\$0
d.iii.	Submit implementation plan (included in d.ii.1) (see Note 1)	\$0	\$0	\$0	\$0	\$0
e.i.-iii.	Risk reduction program (included in MRP 1.0) (see Note 1)	\$0	\$0	\$0	\$0	\$0
<b>Total Costs</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$7,000</b>

**Note:**

1. Almost all of the costs to implement the Mercury requirements are covered by the PCB implementation costs. In meeting PCB load reduction requirements, the County also meets the Mercury load reduction requirements.

**Appendix Table 5. MRP 2.0 Cost Correction 1  
Without 2019 PCB Load Reduction**

Provision No.	Additional Requirements	Expenditures					Totals
		2016	2017	2018	2019	2020	
C.3	Trash	\$55,000	\$719,000	\$539,000	\$419,000	\$344,000	\$2,076,000
C.10	Green Infrastructure	\$0	\$91,500	\$41,000	\$889,000	\$43,000	\$1,064,500
C.11 and C.12	Mercury and PCB	\$31,000	\$11,000	\$13,423,000	\$61,000	\$172,184,000	\$185,710,000
<b>Totals</b>		<b>\$86,000</b>	<b>\$821,500</b>	<b>\$14,003,000</b>	<b>\$1,369,000</b>	<b>\$172,571,000</b>	<b>\$188,850,500</b>