

# WATER CLIMATE BONDS STANDARD VERIFICATION LETTER

**Issuing Entity:** The San Francisco Public Utilities Commission

**Kind of engagement:** Assurance Engagement

**Period engagement was carried out:** March 22<sup>nd</sup> 2016 to April 29<sup>th</sup> 2016

**Approved verifier:** Sustainalytics US Inc,

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## Scope:

The San Francisco Public Utilities Commission (“SFPUC”), has engaged Sustainalytics to review and verify that SFPUC’s green bond meets the requirements of the Water Climate Bond Standard. This bond will be issued to fund eligible projects in sustainable stormwater management and wastewater projects.

## Criteria

Water Climate Bond Standard

B. Adaptation Theme

1. Allocation
  - All criteria
2. Governance
  - All criteria
3. Vulnerability Assessment
  - All criteria
4. Adaptation Plan
  - All criteria

## Issuing Entity’s Responsibility

SFPUC is responsible to provide information and documents relating to:

- The details concerning water allocation and availability
- The governance process for water entitlements and allocation, management systems, and conflict resolution mechanisms
- The details concerning the vulnerability assessment conducted
- The details concerning the adaptation plan produced

## Independence and Quality Control

Sustainalytics, a leading provider of ESG and corporate governance research and ratings to investors, conducted the verification of SFPUC’s green bond, issued to fund eligible projects included in its Sewer System Improvement Program: Phase 1, and provided an independent opinion informing the conformance of the green bond with the Water Climate Bond Standard. Sustainalytics makes all efforts

to ensure the highest quality and rigor during its assessment process and enlisted its Sustainability Bonds Review Committee to provide oversight over the assessment of the bond.

### Verifier's Responsibility

The work undertaken as part of this engagement included conversations with relevant SFPUC employees and the review of relevant public and internal documents to assess the following:

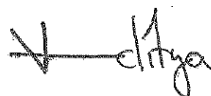
- Conformance of SFPUC's green bond with the Water Climate Bonds Standard;
- The Criteria included under the Adaptation Theme: Allocation, Governance, Vulnerability Assessment, and Adaptation Plan
- Conformance with the Internal Processes & Controls requirements;
- Conformance with Reporting Prior to Issuance requirements.

### Restriction on Distribution and Use of Report

This report along with the information provided is for the use and publication of SFPUC and Climate Bond Standard Board only and not for the use of any other external parties.

### Opinion

Based on the limited assurance procedures conducted, nothing has come to Sustainalytics' attention that causes us to believe that, in all material respects, SFPUC's green bond, issued to fund eligible projects included in the Sewer System Improvement Program: Phase 1, is not in conformance with the Water Climate Bonds Standard Pre-Issuance Requirements.



Vikram Puppala  
April 29<sup>th</sup>, 2016  
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Toronto ON M5T 2C7, Canada.

## Part B: Detailed Findings

Procedure Performed	Factual Findings	Error or Exceptions Identified
<p>Review of the Adaptation Theme criteria and scoring of the four categories:</p> <ol style="list-style-type: none"> <li>1. Allocation</li> <li>2. Governance</li> <li>3. Vulnerability Assessment</li> <li>4. Adaptation Plan</li> </ol>	<p>Scoring table listed in Appendix 1 of the document meets the minimum scoring requirements outlined within the Water Criteria under the Climate Bonds Standard</p> <p>Allocation 15/17                      Governance 12.5/14                      Vulnerability Assessment 22/23                      Adaptation Plan 5/5</p>	<p>None</p>
<p>Verification of management and disbursement of funds based on the confirmation from SFPUC that the Sewer System Improvement Program has a separate account and each project within the program has a sub-account. Each fiscal year also has its own account. All accounts are held at the city treasurer.</p> <p>Review of Debt Administration &amp; Accounting Process Overview Document</p>	<p>Confirmation that SFPUC has the necessary tracking processes to conform to the Climate Bonds Standard tracking requirements.</p>	<p>None</p>
<p>Verification that SFPUC commits to maintain a report to track the net bond proceeds and spend related to the nominated project categories in the Sewer System Improvement Plan: Phase 1.</p>	<p>Confirmation that SFPUC has the necessary reporting processes to conform to the Climate Bonds Standard reporting requirements.</p>	<p>None</p>

Appendix 1:

Annex C: Checklist

A. Mitigation Theme

As discussed above, the Mitigation Theme has two major categories: (1) *the determination of project- related emissions*, and (2) *determination of emissions reduced/avoided*. Eligibility for certification under this theme is determined through existing methodologies deemed acceptable under the Water Climate Bonds Standard (e.g. CDM, American Carbon Registry, etc.) (see Step 3, Mitigation Theme)

Under the guidance of the methodology selected, the Issuer must propose a clear GHG baseline, which must describe the calculations and assumptions (inputs) used to arrive at that baseline. Issuers must also estimate net expected GHG impact (mitigation impact >0) compared to Business As Usual, as well as a credible, independently verifiable, method of tracking impact over the life of the bond. Conservative assumptions, values and procedures must be used to ensure that the GHG emission reductions or removals are not over-estimated.

B. Adaptation Theme

1. Allocation

Criteria	Evidence (E) Disclosure (D)	Max Score	Actual Score
<p><b>Are there accountability mechanisms in place for the management of water allocation that are effective at a sub-basin and/or basin scale?</b></p> <p>A mixture of state, federal, special commissions and agencies, and lower-level organizations that manage water across the San Francisco Bay / Sacramento River Delta region</p>	D	1	1

<p><b>Are the following factors taken into account in the definition of the available resource pool?</b></p> <ul style="list-style-type: none"> <li>A. <b>Non-consumptive uses (e.g., navigation, hydroelectricity)</b></li> <li>B. <b>Environmental flow requirements</b></li> <li>C. <b>Dry season minimum flow requirements</b></li> <li>D. <b>Return flows (how much water should be returned to the resource pool, after use)</b></li> <li>E. <b>Inter-annual and inter-seasonal variability</b></li> <li>F. <b>Connectivity with other water bodies</b></li> <li>G. <b>Climate change impacts</b></li> </ul> <p>These factors are largely governed at the state level by the CA State Water Board, as well as a variety of speciality groups, such as SP PUC (refer to master water plan), federal and state navigation standards, SWB and US EPA environmental flow requirements (<a href="http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml">http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml</a>), CA energy governance</p>	E	7	A – 1 B -1 C – 1 D – 1 E – 1 F – 1 G – 1
<p><b>Is there a distinction between the allocation regimes used in “normal” times and in times of “extreme/severe” water shortage?</b></p> <p>Yes, described here:  <a href="http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=8838">http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=8838</a>,  <a href="http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=1055">http://www.sfwater.org/Modules/ShowDocument.aspx?documentID=1055</a></p>	E	1	1

<p><b>What arrangements are in place, if any, to accommodate the potentially adverse impacts of climate change on the resource pool? (E.g. using best available science to plan for future changes in availability, undertaking periodic monitoring and updating of available pool.)</b></p> <p>The 2010 and 2015 Urban Water Management Plans both outline at chapter level impacts to date and alternative plans for handling crisis periods.</p>	E	1	1
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<p><b>Are there plans to define “exceptional” circumstances, such as an extended drought, that influence the allocation regime? (E.g., triggers water use restrictions, reduction in allocations according to pre-defined priority uses, suspension of the regime plan, etc.)</b></p> <p>Yes, see Urban Water Management Plans. See also a separate city / county plan: <a href="http://www.sfwater.org/modules/showdocument.aspx?documentid=4168">http://www.sfwater.org/modules/showdocument.aspx?documentid=4168</a></p>	E	1	1
<p><b>For international / transboundary basins, is there a legal mechanism in place to define and enforce water basin allocation agreements? (answer may be NA)</b></p>	D	1	N A
<p><b>Are water delivery agreements defined on the basis of actual <i>in situ</i> seasonal/annual availability instead of volumetric or otherwise inflexible mechanisms?</b></p> <p>Yes. The State Water Board defines water rights in this way, so that in times of crisis such as severe droughts water shortages are shared proportionally among defined water users.</p>	E	1	1

<p><b>Has a formal environmental flows (e-flows)/sustainable diversion limits or other environmental allocation been defined for the relevant sub-basin or basin? <i>If preexisting</i>, has the environmental flows program been updated to account for the new project?</b></p> <p>There is an interagency group that has developed a Bay-Delta watershed management plan, which includes city, county, state, and federal entities. The plan is regularly updated.  <a href="http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml">http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml</a>. For the Tuolumne River aspect, a detailed SFPUC plan has been prepared: <a href="http://utrep.blogspot.com/2014/04/draft-oshaughnessy-dam-instream-flow.html">http://utrep.blogspot.com/2014/04/draft-oshaughnessy-dam-instream-flow.html</a></p>	E	1	1
<p><b>Have designated environmental flows / allocation programs been assured / implemented?</b></p> <p>Yes. See above.</p>		1	1
<p><b>Has a mechanism been defined to update the environmental flows plan periodically (e.g., every 5 to 10 years) in order to account for changes in allocation, water timing, and water availability?</b></p> <p>Unclear.</p>	E	1	0
<p><b>Is the amount of water available for consumptive use in the resource pool linked to a public planning document? (E.g., a river basin management plan)</b></p> <ol style="list-style-type: none"> <li>1. <b>Yes, the limit is linked to a river basin management plan</b> (Yes, both via the State Water Board and the Bay-Delta Management plan cited above)</li> <li>2. <b>Yes, the limit is linked to another planning document, please indicate:</b> _____</li> <li>3. <b>No, the limit is not linked to any planning document</b></li> </ol>	D	If 1 or 2, then 1	1

<b>If present, is the river basin plan a statutory instrument that must be followed rather than a guiding document?</b>	D	1	1
<b>Total</b>		<b>17</b>	<b>15</b>

**2. Governance**

Criteria	Evidence (E)/ Disclosure (D)	Max Score	Actual Score
<p><b>How are water entitlements defined?</b></p> <p><b>A. Purpose that water may be used for</b></p> <p><b>B. Maximum area that may be irrigated</b></p> <p><b>C. Maximum volume that may be taken in a nominated period</b></p> <p><b>D. Proportion of any water allocated to a defined resource pool</b></p> <p><b>E. No formal definition exists</b></p> <p><b>A - D = 1; E = 0</b></p>	D	1	A & D – 1

<p><b>Is the surface water system currently considered to be:</b></p> <ul style="list-style-type: none"> <li>A. <i>Over-allocated</i> (e.g. current use is within sustainable limits but there would be a problem if all legally approved entitlements to abstract water were used)</li> <li>B. <i>Over-used</i> (existing abstractions exceed the estimated proportion of the resource that can be taken on a sustainable basis)</li> <li>C. Neither over-allocated nor over-used</li> </ul> <p><b>A = 0.5, B = 0, C = 1</b></p>	E	1	0.5
<p><b>If monitored and the investment uses groundwater, is the groundwater water system currently considered to be:</b></p> <ul style="list-style-type: none"> <li>A. <i>Over-allocated</i> (e.g. current use is within sustainable limits but there would be a problem if all legally approved entitlements to abstract water were used)</li> <li>B. <i>Over-used</i> (existing abstractions exceed the estimated proportion of the resource that can be taken on a sustainable basis)</li> <li>C. Neither over-allocated nor over-used</li> </ul>	E	1	NA

<p><b>How are limits on the amount/rate of abstraction defined?</b></p> <p>A. <b>There is a limit in the volume of water that can be abstracted</b></p> <p>B. <b>There is a limit to the proportion (e.g. percentage) of water that can be abstracted</b></p> <p>C. <b>There are restrictions on who can abstract the water (but no limit on how much water can be abstracted)</b></p> <p>D. <b>There is no explicit limit on water abstraction</b></p> <p><b>A = 0.5, B = 1, C = 0.5, D = 0</b> According to the State Water Board, B</p>	E	1	1
<p><b>Are governance arrangements in place for dealing with exceptional circumstances (such as drought, floods, or severe pollution events), especially around coordinated infrastructure operations?</b></p> <p>Yes, there are explicit plans for all these categories of events, crossing a number of institutional levels. The most relevant for this issuance are described in the Urban Water Management Plans 2010 and 2015 (imminent approval).</p>	D	1	1
<p><b>Is there a process for re-evaluating recent decadal trends in seasonal precipitation and flow OR recharge regime, in order to evaluate “normal” baseline conditions?</b></p> <p>Yes. The Urban Water Management Plan is a periodic review document, based on recent trends in usage and flows.</p>	D	1	1
<p><b>Is there a formal process for dealing with new entrants?</b></p> <p>Yes, defined through the State Water Board process.</p>	D	1	1
<p><b>For existing entitlements, is there a formal process for increasing, varying, or adjusted use(s)?</b></p> <p>Yes, also through the State Water Board.</p>	D	1	1

<p><b>Is there policy coherence across sectors (agriculture, energy, environment, urban) that affect water resources allocation, such as a regional, national, or basin-wide Integrated Water Resources Management (IWRM) plan?</b></p> <p>Yes, through several mechanisms. There are interagency processes at the state level, as well as the aforementioned environmental flows work.</p>	E	1	1
<p><b>Are obligations for return flows and discharges specified and enforced?</b></p> <p>Yes, also monitored. There is a network of state, local and federal agencies involved.</p>	D	1	1
<p><b>Is there a mechanism to address impacts from users who are <i>not</i> required to hold a water entitlement but can still take water from the resource pool?</b></p> <p>Not clearly defined.</p>	D	1	0
<p><b>Is there a pre-defined set of priority uses within the resource pool? (E.g., according to or in addition to an allocation regime)</b></p> <p>Priority usage is clearly defined at the state level.</p>	D	1	1
<p><b>If there are new entrants and/if entitlement holders want to increase the volume of water they use in the resource pool, can new entitlements be issued or existing entitlements be augmented?</b></p> <p><b>A. Yes, no restrictions</b>  <b>B. No, catchment is closed</b>  <b>C. Yes, if conditional on:</b></p> <ol style="list-style-type: none"> <li><b>1. Assessment of third party impacts</b></li> <li><b>2. Environmental impact assessment (EIA)</b></li> <li><b>3. Existing user(s) forgoing use</b></li> </ol> <p><b>Yes = 0, No = 1, Restrictions = 1 (if conditions include one or more of 1-3)</b>  C, dependent on 1 – 3 in most cases.</p>	D	1	1

<b>Are withdrawals monitored, with clear and legally robust sanctions?</b> Yes, primarily through federal systems. Sanctions are clear, legally binding, and subject to civil and criminal actions.	E	1	1
<b>Are there conflict resolution mechanisms in place?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	E / D	1	1
Total		14	12.5

### 3. Vulnerability Assessment

Criteria	Evidence (E) / Disclosure (D)	Max Score	Actual Score
<b>Does a water resources model of the proposed investment and ecosystem (or proposed modifications to existing investment and ecosystem) exist? Specify model types, such as WEAP, SWAT, RIBASIM, USACE applications). Scale should be at least sub-basin.</b> HFAM: <a href="http://www.hydrocomp.com/HfamSoftware/Hfam%20II%20Description.htm">http://www.hydrocomp.com/HfamSoftware/Hfam%20II%20Description.htm</a> Sea-level rise is handled separately <a href="http://onesanfrancisco.org/wp-content/uploads/Guidance-for-Incorporating-Sea-">http://onesanfrancisco.org/wp-content/uploads/Guidance-for-Incorporating-Sea-</a>	E	1	1
<b>Can the system model the response of the managed water system to varied hydrologic inputs and varied climate conditions? yes</b>	E	1	1

<p><b>Are environmental performance limits (ecosystem, species, ecological community) and/or ecosystem services specified?</b></p> <p>Yes, in a separate study:  <a href="http://www.hydrocomp.com/HfamSoftware/Hfam%2011%20Description.htm">http://www.hydrocomp.com/HfamSoftware/Hfam%2011%20Description.htm</a></p>	E	1	1
<p><b>Can these performance limits be defined and quantified using the water resources model?</b></p> <p>Yes, in the above study.</p>	E	1	1
<p><b>Have these limits been defined based on expert knowledge and/or scientific analysis? Yes</b></p>	E	1	1
<p><b>Are these performance limits linked to infrastructure operating parameters? Yes</b></p>	E	1	1
<p><b>Are these limits linked to an environmental flows regime? Yes, both for the Bay and Tuolumne River</b></p>	E	1	1
<p><b>For new projects, is there an ecological baseline evaluation describing the pre-impact state?</b></p>	E	N A	NA
<p><b>For rehabilitation / reoperation projects, is there an ecological baseline evaluation available before the projects was developed?</b></p> <p>Yes, cited in the scoping documents listed above as well as in environmental flows documents.</p>	E	1	1
<p><b>Has there been an analysis that details impacts related to infrastructure construction and operation that has been provided? Do not see this</b></p>	E	1	0

<b>Are lost species and/or lost or modified ecosystem functions specified for restoration in the environmental evaluation?</b> Explicitly described in the environmental flows documents.	E	1	1
<b>Have regional protected areas / nature reserves been included in the analysis for impacts from the investment asset and future climate impacts?</b> Yes, especially with the Tuolumne River with USFW support.	E	1	1

<b>Does the model include analysis of regression relationships between climate parameters and flow conditions using time series of historical climate and streamflow data?</b> Yes	E	1	1
<b>Does the model include climate information from a multi-modal ensemble of climate projections (e.g., from the Climate Wizard or the World Bank's Climate Portal) to assess the likelihood of climate risks for the specified investment horizon(s)?</b> Yes	E	1	1
<b>Are changes in the frequency and severity of rare weather events such as droughts and floods included?</b> Yes	E	1	1
<b>Are sub-annual changes in precipitation seasonality included?</b> Yes, especially in the Tuolumne River assessment and the SLR study	E	1	1
<b>Is GCM climate data complemented with an analysis of glacial melt water and sea level rise risks, where appropriate (e.g., high or coastal elevation sites)?</b> Yes	E	1	1

<b>Is paleo-climatic data (e.g., between 10,000 and &gt;1000 years before present) included?</b> Not yet but planned	E	1	1
<b>Is the number of model runs and duration of model runs disclosed? Yes</b>	E	1	1
<b>Has a sensitivity analysis been performed to understand how the asset performance and environmental impacts may evolve under shifting future flow conditions? Yes, in terms of SSIP parameters.</b>	E	1	1
<b>Is directly measured climate data available for more than 30 years and incorporated into the VA?</b> Yes	E	1	1
<b>Does the VA show that climate change has already had an impact on operations and environmental targets? Are these impacts specified and, to the extent possible, quantified? Confer Adaptation Plan Yes, both flows and SLR</b>	E	1	1
<b>Does the VA show that climate change will have an impact on operations and environmental targets over the operational lifespan? Are these impacts specified and, to the extent possible, quantified? Confer Adaptation Plan Yes, both flows and SLR</b>	E	1	1
<b>Is there a discussion of the uncertainties associated with projected climate impacts on both operations and environmental impacts? Yes</b>	E	1	1
Total		23	22

#### 4 Adaptation Plan

Criteria	Evidence (E)/ Disclosure (D)	Max Score	Actual Score
<p><b>Is there a plan to restore or secure lost/modified ecosystem functions / species? Confer VA</b> Yes, in the Tuolumne River environmental flows management plan</p>	E	1	1
<p><b>Is the adaptation plan for environmental targets / infrastructure robust across specified observed / recent climate conditions? Confer VA.</b> Observed impacts have already been significant. The SSIP is designed to be robust to current impacts.</p>	E	1	1
<p><b>Is the adaptation plan for environmental targets / infrastructure robust across specified projected climate conditions? Confer VA.</b> The SSIP has extensive plans for changes in both a range of outcomes for SLR and climate variability.</p>	E	1	1
<p><b>Is there a monitoring plan designed to track ongoing progress and impacts to inform future decisions?</b> Yes, especially in the Urban Water Management Plan</p>	E	1	1
<p><b>Is there a plan to reconsider on a periodic basis the VA for operational parameters, governance and allocation shifts, and environmental performance targets?</b></p>	E	1	1
<b>Total</b>		<b>5</b>	<b>5</b>



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