

**AMENDMENT NO. 5 TO THE AGREEMENT  
BETWEEN THE CITY OF SAN MATEO AND  
WATERWORKS INDUSTRIES, INC. FOR  
MARINA LAGOON VEGETATION AND WATER QUALITY MANAGEMENT  
(\$539,730 [Original Amount], \$93,000 [Amendment 1], \$44,770 [Amendment 2], \$181,480  
[Amendment 3], \$50,000 [Amendment 4], \$830,000 [Amendment 5])**

WHEREAS, the City of San Mateo (“City”), a municipal corporation of the State of California, and Waterworks Industries, Inc. (Consultant”), entered into an Agreement for Marina Lagoon Vegetation and Water Quality Management Professional Services (“Agreement”) on February 4, 2020; and

WHEREAS, City and Waterworks Industries, Inc. wish to amend the Agreement effective November 21, 2022, to increase scope and compensation, and extend the term of this agreement.

NOW, THEREFORE, the parties agree as follows:

1. Section 1 – Scope of the Agreement is amended to reference “Exhibit A, A1, and A2”
2. Section 4 - Term of the Agreement is amended to read, “The services to be performed under this agreement shall commence on February 4, 2020, and be completed on March 15, 2024.
3. Section 5 – Payment of the Agreement is amended to reference “the services set forth in Exhibit A, A1, and A2”, and the fee schedule set forth in Exhibit B5 to the Agreement is attached and incorporated by reference, changing the fee from \$908,980 to \$1,738,980.
4. The remaining terms of the Agreement remain in full force and effect.

IN WITNESS WHEREOF, CITY OF SAN MATEO and WATERWORKS INDUSTRIES, INC. have executed this Agreement on \_\_\_\_\_.

CITY OF SAN MATEO

CONSULTANT

\_\_\_\_\_  
Azalea Mitch  
Public Works Director

\_\_\_\_\_  
Richard Carnation  
CEO, Waterworks Industries, Inc.

Attachments:

Exhibit A2  
Exhibit B5

**EXHIBIT A2**  
**SCOPE OF WORK**  
**Marina Lagoon Vegetation and Water Quality Management**  
**Waterworks Industries, Inc., Amendment #5**

Consultant shall provide aquatic vegetation and water quality management professional services for the Marina Lagoon in San Mateo. The following are clarifications and additions to the original Scope Exhibit A, and Amendment #2, Exhibit A1; and are consistent with an updated Exhibit B5 – Payment Rates.

**PRIMARY SCOPE OF SERVICES**

- A. Routine Inspection and Ambient Monitoring: Weekly lagoon inspections and observed debris removal.
- a. In coordination with the weekly inspection and monitoring, remove trash and debris in the water, along banks.
  - b. This task does not include debris recycling and disposal costs identified in the Payment Rates Exhibit B5; but does include personnel and equipment costs.
  - c. Larger debris requiring specialized boats or equipment are special requests and per rates identified in Exhibit B5.
- B. Regulatory Compliance: Provide all tasks for the City in conformance with requirements of pertinent regulatory agencies, policies, and plans, and permits. All tasks in this Scope of Work must be in conformance with the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters Of the United States from Algae and Aquatic Weed Control Applications; California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement SAA No. 1600-2013-0268-R3, a United States Army Corps of Engineers Regional General Permit, a California Regional Water Quality Control Board Water Quality Certification for maintenance activities at the Marina Lagoon, the City's Aquatic Pesticide Application Plan, and DPR licensing and other requirements for application of pesticides by an individual and business. Use of integrated pest management (IPM) principles (e.g., pre-emergent prevention or minimization of nuisance growth, use of least toxic but comparably effective suppression methods, and techniques for most effective use of physical and chemical controls). Regulatory Compliance tasks are described in Exhibit A, A1, and updated costs in Exhibit B4 as follows.
- a. Consulting / Regulatory Support: The project team will provide as-needed consulting and support for items including, but not limited to, IPM, NPDES compliance, CDFW SAA compliance, calls and or meetings, DPR Research Authorization and/or Special Local Needs labeling, interpretation of DPR regulations and product labels, timing of maintenance activities relative to regulatory constraints, support related to known or suspected harmful algae blooms (HABs), coordination and/or communication with regulatory agencies, algae and widgeongrass management, site scouting and pest ID, assistance calculating use rates/amounts for application, and as-needed technical consulting.
  - b. NPDES Water Quality Monitoring & Lab Analysis: Based on the City's APAP, NOI, and intended applications, Contractor & Associated staff will collect and submit for analysis surface water samples according to Permit requirements. During or shortly after sample collection, we will perform necessary field chemistry analysis (pH, electrical conductivity (EC), dissolved oxygen (DO) and turbidity) and submit properly preserved and labeled samples under chain of custody procedures to a qualified analytical laboratory for chemical

analysis. Upon receipt of analytical data, staff will review and quality assure the data and prepare a brief summary of results for inclusion in the annual report to the SWRCB.

- c. NPDES Data Tabulation & Annual Report: As described in the City's APAP, several time-sensitive reporting requirements exist in the event of non-compliance with the permit. Contractor & Associated will perform a timely review of applicable data and documentation and inform the City of a potential or an actual non-compliant circumstance, if any. Examples of time-specific reporting include the 24-hour report and the 5-day written report if occurrences of non-compliance are encountered. Based on monitoring results from Task C.b. above, Blankinship & Associates will compile analytical laboratory, field analysis, observation and herbicide application data and prepare the required tables and text for the City's draft annual report. After the City's review of the draft report and our incorporation of edits, we will submit a final annual report to the SWRCB and RWQCB on the District's behalf.
  - d. Lagoon Management Plan (LMP) Finalization Contractor & Associated staff will finalize and deliver a draft LMP to the City for review. Upon incorporation of comments and based on the City's feedback, we will finalize the plan for implementation.
  - e. Annual Lagoon Management Plan Implementation: Contractor & Associated staff will prepare an implementation memorandum to the LMP describing the actions that will be taken in 2023 with suggested actions and timing. As needed, on-call support will be provided to discuss the benefits or limitations of management actions in the Lagoon so implementation is effective and consistent with the City's goals. The implementation plan may be revised during the year to reflect any changes in management challenges observed in the Lagoon.
  - f. RMA Pre Harvesting Nesting Bird Survey: A CDFW-approved biologist will conduct a nesting bird survey of the Zone(s) to be harvested, staging and stockpile areas consistent with SAA requirements. The survey will be completed as close to the initiation of harvesting as feasible, but no more than 15 days prior to the start of work. If active nests are located during the survey, species appropriate no-disturbance buffers will be established to prevent adverse impacts to the active nest. A KMZ or PDF map with the location of the nest and applicable buffer around the nest will be provided to the City, harvester staff and CDFW prior to the start of harvesting activities.
  - g. RMA Dock Installation Nesting Bird Survey: A CDFW-approved biologist will conduct a survey of the dock, area of influence where disturbance due to dock installation activities, and staging areas that could impact the success of any active nests. If active nests are located during the survey, activity- and species-appropriate no-disturbance buffers will be established to prevent adverse impacts to the active nest. A KMZ or PDF map with the location of the nest and applicable buffer around the nest will be provided to the City, dock contractor and CDFW prior to the start of activities.
  - h. Additional Fluridone Testing: As needed, Contractor & Associated staff will conduct monitoring for vegetation and/or fluridone. This work may support a DPR Research Authorization or application for a Special Local Needs label for fluridone products to be used to support the City's management of widgeongrass in the Lagoon. Beach Cleanup: Once per week beach cleanup at each of Marina Lagoon's public beach parks 1) Aquatic Parkside and 2) Lakeshore. This task includes skimming the water along the shoreline for algae and debris or litter; and removal of such materials. This task does not include debris recycling and disposal costs identified in Exhibit B4
- C. Herbicide Treatments with Fluridone or Imazamox: Regulatory constraints have limited or prohibited the use of active ingredient herbicides such as copper and fluridone. In 2022, it was

determined that widgeongrass was not responsive to treatment with diquat, and it was not an effective control agent in 2022. It is probable that the regulatory approvals necessary to use fluridone for the 2023-24 management year will not be granted; as the field study necessary to obtain a Special Local Needs Registration for fluridone use has been unsuccessful to date due to timing and growth conditions on the lagoon. There is a small chance it will be approved for use in 2023-24 if another study is conducted and approved.

The next most fiscally effective and regulatorily approved product is Imazamox, which is more expensive; but is the most likely scenario for the 2023 season. Because Imazamox is a contact management tool, the widgeongrass needs to have grown enough for the Imazamox to penetrate and control it. This will result in some fragments of the widgeongrass growth to break loose and there will be some harvesting required to clean up the fragments that are historically windblown towards the Eastern side of the Lagoon. It has been recommended by the PCA that the lagoon wide treatment with Imazamox be between 100 and 300 ppb and have three treatments spread out through the season. A copy of pest control recommendations will be provided by April 2 each year.

- D. Algicide Treatment and Dye: GreenClean Liquid 5.0 worked well on most of the algae but it's hard to say how effective it was on the algae regrowing as this 2022 year ended up having over four times the amount of widgeongrass in the lagoon absorbing nutrients and out competing with the algae for the regrowth. It is assumed that shoreline acres will need to be treated three times throughout the growth season, with an estimated 130 acres total.

Aquatic dyes are a potential for use in Marina Lagoon and is highly recommend to help thwart the growth of algae and widgeongrass with the inexpensive and effective black and blue combination dye that is utilized in Foster City. Aquatic dyes will not be used without prior approval from the City.

- E. Mechanical Harvesting: The harvester included in the original RFP for some incidental harvesting was the H8-200 which has a 8 foot wide cutting head and 200 cubic feet of vegetation capacity per trip. Because of the amount of vegetation growth in 2022, Waterworks brought in two H10-650 harvesters. These units have a 10 foot cutting head width and 650 cubic feet of vegetation storage per trip. These machines have three times the capacity of the originally quoted machine.

The H10-650 Harvesters increased the amount of harvested material out of the lagoon from 81.1 tons in 2021 to 428.68 tons in 2022. There was still a lot of harvested material that was not able to be harvested out and the expected quality of the lagoon could still be improved upon with larger and more harvesters. There was a large number of complaints from April through July 2022 and recreation was limited.

For 2023, Waterworks Industries has purchased and taken receipt of two additional H11-1050 stainless steel harvesters that have a 11 foot cutting head width and a much larger carrying capacity of 1050 cubic feet, some of the largest in the United States and the two largest in California as far as we know. These two harvesters will be able to harvest and transport an additional 40% more vegetation per trip which will increase the speed and volume of widgeongrass removed from the lagoon. Additionally, the existing H10-650 Stainless Steel harvester will be the 3<sup>rd</sup> available harvester to help with the removal of the widgeongrass if it is needed. By having all three of the above harvesters working, the harvesting operation will have improved from 1300 cubic feet of widgeongrass removed per trip in 2022 to a 2023 capacity of 2750 cubic feet of widgeongrass removed per trip. Doubling the amount removed per trip from a capacity point of view.

This increased capacity is more expensive of an operation. Because of the size of these harvesters, everything is bigger, heavier and more expensive to operate from transporting them to the lagoon, operating them in the lagoon and unloading the widgeongrass onto the specialty trailer and transporting the widgeongrass to the landfill or the park area to dry for a short period of time. An additional project manager would be needed for a larger harvesting operation 40 days.

Associated costs are outlined per potential unit in Exhibit B4. Harvester Days include equipment and labor. The Truck and Transfer Trailer are costed out per day of harvesting activity. Aquatic Vegetation disposal fees are costed out separately and charged at cost. If vegetation is spread at Laguna Vista Park to dry, and excavator charge per day is included as well.

- F. Debris and Special Work Request: Debris disposal costs for routine weekly inspection/trash removal and beach cleanups are included at cost. Post-storm or non-routine cleanup events as requested to remove large debris or objects, and to inspect and remove litter and debris collected at the trash boom downstream from Laurel Creek are included at per-hour rates with or without boat operated assistance.
- G. Project Administration and Communications -
- a. Weekly – Complete daily work reports for inspections, physical activities and chemical treatments, that clearly describes areas where work was conducted, types and amounts of aquatic pesticide(s) used at each application event, types and extent of physical activities conducted and amount and types of debris removed, and water quality observations.
  - b. Weekly – Each Monday during plant nuisance season, communicate general observations on nuisance growth, and the tentative action plan for the remainder of the week.
  - c. Monthly, by the 10th – Provide copies of daily/weekly work reports for the previous month, and provide a summary of the number of treatments, and types and quantities of pesticides applied using the DPR monthly summary pesticide use report. The GPS tracks and associated data along with the harvested masses of aquatic vegetation will also be included in monthly reports. Payment for services is contingent upon timely receipt of this information.

**Vegetation and Water Quality Management Scenario Cost Estimates:** Costs were estimated for best case, most likely case, and worst-case scenarios, using various combinations of tasks in the Payment Rates schedule and estimated quantities listed in Exhibit B4. All three management scenarios include a Baseline Cost of **\$231,509**, which includes:

- Weekly Inspections
  - All Regulatory Compliance Tasks
  - Weekly Beach Cleanups
  - Algaecide Water Quality Treatments
  - Debris Disposal and Special Cleanup Requests
1. The most fiscally effective **and** regulatorily approved product is Imazamox. The most likely scenario is effective herbicide treatment with Imazamox combined with supplemental harvesting for 20 days using one machine. This product is for control of widgeongrass as a contact management tool. That means that Imazamox, like Diquat needs to be applied only after the widgeongrass is growing

and present in the lagoon. This Imazamox methodology is effective as a lagoon wide treatment plan so that the Imazamox ppb rates are high enough to be an effective control agent. It has been recommended by the PCA that the lagoon wide treatment with Imazamox be between 100 and 300 ppb and have three treatments spread out through the season. It is estimated that the three treatments of Imazamox and the supplemental 20 days of harvesting, off hauling and disposal would cost \$598,000, plus the Baseline cost of \$231,509 for a total of **\$829,509**, rounded up to \$830,000. This is the recommended cost approach given the unlikely scenario of fluridone approval described below.

2. The preferred management scenario would be fluridone approval (unlikely) and use with some supplemental harvesting. This is the most economical management with a product that has been historically 85-95% effective resulting in some harvesting activities that will still be needed. We estimate that the costs to manage the lagoon with a full fluridone lagoon treatment of an initial 90 ppb treatment followed up by two separate 30 ppb treatments can get San Mateo a historic 85-95% effective control rate. The minimally supplemental harvesting will potentially require about 20 harvesting days, utilizing the H11-1050 harvester, truck and transfer trailer, and vegetation disposal. It is estimated that the three treatments of the fluridone and the supplemental 20 days of harvesting, off hauling and disposal would cost \$397,844.90, plus the Baseline cost of \$231,509 for a total of \$629,353.
3. The worst case would be full herbicide treatments (either fluridone or Imazamox) proving ineffective due to storm wash out, resistance, or other unknowns. In this case a full-scale harvesting operation would be needed utilizing three large harvesters for an estimated 80 days, ground equipment, off-hauling, project management, and disposal. The total cost including Baseline costs for this scenario are between \$1,030,354 and \$1,230,508.

## Exhibit B5 - Fee Schedule 2023

Project Task	Unit	Estimated Units	Cost /unit	Total Estimate
<b>Weekly Lagoon Inspections/Observed Debris Removal</b>	Day	52	\$575	\$29,900
<b>Beach Cleanup- Once Per Week</b>	Hour	52	\$75	\$3,900
<b>Regulatory Compliance</b>				
Consulting / Regulatory Support	Hours	60	\$225	\$13,500
NPDES Water Quality Monitoring & Lab Analysis	Annual NTE Budget	1	\$15,000	\$15,000
NPDES Data Tabulation & Annual Report	Report	1	\$3,850	\$3,850
Lagoon Management Plan Finalization	Event	1	\$5,500	\$5,500
Annual Lagoon Management Plan Implementation	Event	1	\$2,200	\$2,200
RMA Pre Harvesting Nesting Bird Survey	Event	2	\$2,000	\$4,000
RMA Dock Installation Nesting Bird Survey	Event	5	\$1,850	\$9,250
Additional Fluridone Testing	Event	1	\$15,000	\$15,000
<b>Best Case Scenerio Herbicide Treatment - Fluridone</b>				
Herbicide - Fluridone - Initial 90 ppb treatment	Acre Feet	530	\$294	\$155,995
Herbicide - Fluridone -30 ppb bump treatment	Acre Feet	530	\$123	\$64,925
Herbicide - Fluridone -30 ppb bump treatment	Acre Feet	530	\$123	\$64,925
<b>Second Best Case Scenerio Herbicide Treatment - Imazamox</b>				
Herbicide - Imazamox 100-300 ppb Initial Treatment W-MSO	Acre Feet	530	\$306	\$162,000
Herbicide - Imazamox 100-300 ppb Second Treatment W-MSO	Acre Feet	530	\$306	\$162,000
Herbicide - Imazamox -100-300 ppb Third Treatment W-MSO	Acre Feet	530	\$306	\$162,000
Extra Treatment for wash out	Acre Feet	530	\$306	\$162,000
<b>Mechanical Harvesting with Vegetation Off Haul</b>				
Harvester H10-650	8-hour Day	20	\$2,800	\$56,000
Harvester H11-1050	8-hour Day	20	\$3,500	\$70,000
Truck and Walking Floor 1050 CF Shoreline Transfer Trailer	8-hour Day	20	\$1,200	\$24,000
Excavator to disperse and reload Vegetation	Day	60	\$225	\$13,500
Aquatic Vegetation Disposal Fees - Actual Cost	Yard	300	\$58	\$17,250
<b>Water Quality Treatments</b>				
Algaecide Applications - Green Clean Liquid 5.0	Shoreline Area Acres	131.25	\$678	\$88,963
Aquatic Dye - 50/50 Black and Blue	Acre Feet	795	\$28	\$22,196
<b>Debris and Special Work Request</b>				
Debris Recycling and Disposal Estimate	Cubic Yard	150	\$55	\$8,250
Storm / Special Request Clean Up w/ Boat Operated	Per Hour	20	\$275	\$5,500
Storm / Special Request Clean Up	Per Hour Labor	60	\$75	\$4,500