

WHEREAS, Langan Engineering & Environmental Services, have submitted a Contract Change Order for Additional Services in the amount of \$100,100.00 to provide wastewater engineering services for the James Drive Treatment Plant; and

WHEREAS, the Department of Environmental Protection has granted an Extension of the Zinc and Copper Permit Limits Compliance Date until November 1, 2019 based on the submission of the required modifications by Langan Engineering;

BE IT RESOLVED, that the Mayor and Council hereby authorizes the Borough Manager to execute the Contract Change Order for Additional Services with Langan Engineering & Environmental Services.

!

JIM MARTOCCI, MAYOR

I hereby certify that the above Resolution was adopted by the Municipal Council of the Borough of Ringwood at its Business Meeting of January 15, 2019.

NICOLE LANGENMAYR
ACTING MUNICIPAL CLERK

Council Member	Motion	Second	Ayes	Nays	Abstain	Absent
Marfocci			X			
Noonan	X		X			
Bolton			X			
Davison						X
Ferretti		X	X			
O'Keefe			X			
Speer			X			

LANGAN ENGINEERING & ENVIRONMENTAL SERVICES

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CONTRACT CHANGE ORDER FOR ADDITIONAL SERVICES

DATE: January 9, 2019 **REVISED:** _____
CHANGE ORDER NO: Ion Exchange System
PROJECT NO. 100687601
PROJECT TITLE: **Wastewater Engineering Services (James Drive Plant)**
ORDER BY: Scott Heck
COMPANY: Borough of Ringwood

STATEMENT OF WORK

On 1 November 2019, the final Copper and Zinc permit limits will become effective for the James Drive WWTF. Based on the review of DMRs for the past three years, the James Drive WWTF does not consistently meet the final permit limit for these heavy metals. These heavy metals are leaching into the water supply from older pipes and find its way into the WWTF. The James Drive WWTF does not have any chemical process for the removal of these heavy metals.

Copper and zinc is removed from wastewater by ion exchange softening and is an accepted practice with the USEPA. The ion exchange equipment will be installed after the existing dual media filter prior to disinfection. Based on industry reported data, removal efficiency is reported to be 95 percent for copper up to levels of 20 mg/l and for zinc up to levels of 100 mg/l. The copper and zinc are removed by ion exchange softeners, along with the calcium and magnesium hardness. In the ion exchange process the elements removed are replaced by sodium from the resin. The ions which are removed are washed from the resin with a brine solution. Regeneration of the resin with brine is required when the resin becomes saturated with the elements being removed and thus no longer effective.

The influent feed to the Ion Exchange Unit to treat heavy metals needs to be 0.5mg/l or less of Total Suspended Solids (TSS). Based on the information provide to Langan, the TSS for the WWTF is consistently below 8mg/l, which is the NJPDES permit limit. The Ion exchange removal units require a TSS of less than 0.5 mg/l. During our due diligence phase, Langan evaluated the following three alternatives for upgrade of the James Drive WWTF for TSS and heavy metal removal:

- Alternative 1 - Drum filter followed by bag filter followed by Ion Exchange
- Alternative 2 - Membrane Bioreactor (MBR) followed by Ion Exchange
- Alternative 3 - Bag filter followed by Ion Exchange

Based on our due diligence review memo, we determined that Alternative 3 is the cheapest alternative and will form the basis of design for the upgrade to the James Drive WWTF. We propose to install the booster pump station, bag filter and the ion exchange system inside the existing building at the James Drive WWTF. The building appears to have the room for the proposed equipment based on a site visit by Langan to the WWTF site. We will confirm this assumption during the conceptual design phase. By locating the ion exchange equipment inside the existing building, we can minimize disturbance beyond the building print. Any disturbance outside the building footprint will trigger flood hazard area and wetlands permitting, which we are proposing to avoid.

For the purposes of this proposal, we have assumed that the Ion Exchange will be manufactured by Tigg, Inc. or Adedge Water Technologies, Inc. In order to allow for competitive bidding, we will specify up to two additional vendors as *approved equal* in the construction documents.

SCOPE OF SERVICES

Langan's scope of services shall include the following tasks:

Task 1. Pre-application meetings with the NJDEP

Langan will attend one pre-application meeting with the NJDEP to discuss the proposed improvements and confirm the permitting strategy for the project. We anticipate that the permitting strategy for the project will include requesting a Highlands Exemption from the Highlands Council and submit plans and specifications for a NJDEP Treatment Works Approval (TWA).

Task 2. Existing Conditions Plan

In order to minimize the site impacts and wetlands/flood hazard area permitting, Langan recommends that the ion exchange equipment should be located inside the existing onsite building and/or on a portion of the elevated slab at the front door to the process building. We have visited the site and find that there is opportunity to locate most of the equipment inside with the possibility of requiring some additional space on the elevated slab. Langan will prepare an as-built plan of the existing equipment within the existing treatment plant building because the Borough does not have any as-built plans. The as-built plan will create a 2-D drawing will all existing equipment and piping inside the building. This drawing will form the basis of the design for the Ion exchange equipment. We will also determine the feasibility of locating the equipment inside the existing building during our site visit.

Task 3. Technical Design Report and Preliminary Layout Drawings

Based on the as-built plan prepared by Langan and input from the manufacturer of the ion exchange, Langan will prepare a preliminary layout plan for the proposed ion exchange equipment. For the purposes of this proposal, we have assumed that the equipment and the

control panel will be located inside the existing building. We will prepare the following preliminary plans:

- a. Equipment Layout Plan
- b. Mechanical Detail Plans
- c. Electrical Plan
- d. Instrumentation Plan

During this task, if we determine that the existing building has no available space for locating the ion exchange system then we will propose a small prefabricated shed/building to house the equipment on the slab next to the generator. The approach here is to avoid any work outside of structures and their foundations as this would trigger significant effort regarding wetlands delineation, surveying and flood hazard permitting.

We will provide detailed sampling and testing over a two week period of the pressure filtration units effluent in order to confirm the final design parameters for (TSS, turbidity before and after pressure filter, pH, hardness, calcium, manganese, silica, bicarbonates, chlorides, nitrates, sodium, sulfates, TDS, copper, zinc, lead and nickel). We will install an ISCO sampler and coordinate with the plant operator. We will arrange to have the samples taken and sent to an independent NJ-certified laboratory for reporting. The refrigerated ISCO sampler will be located in an area to be coordinated with the plant operator.

Task 4. 100% Construction Documents

Langan will respond to any minor comments and prepare mechanical, structural and electrical drawings and specifications for the Ion Exchange equipment. The construction drawings will be submitted to the NJDEP for obtaining a TWA permit and for obtaining bids from contractors. The plan approval package will include the following:

1. Final Technical Design Report
 - a. Ion Exchange Design Calculations and Assumptions
 - i. Flow
 - ii. Mass loadings
 - b. WWTF Components
 - i. Hydraulic profile
 - ii. Process and instrumentation diagram
2. Ion Exchange Plans
 - a. Equipment Layout Plan
 - b. Mechanical Detail Plans
 - c. Plan and Profile Plans
 - d. Utility Plan
 - e. Electrical and Lighting Plan
 - f. Instrumentation Plan
3. Wastewater Treatment Plant (WWTP) Technical Specifications

Langan has included electrical design services to provide electrical power and instrumentation for the Ion Exchange unit. Electrical design shall include main distribution, metering and instrumentation, controls, lighting and power. Electric work will be designed in accordance with the National Electric Code (NEC). We have assumed that the existing electrical service and generator have adequate capacity for handling the electrical load from the Ion Exchange

system. If we find that this is not the case during our design, we will notify you immediately to determine the appropriate course of action.

We will connect the ion exchange alarms to the existing alarm annunciation panel to notify the plant operators.

Task 5. Permitting and Revisions through Approval Process

Langan will prepare an application for submission to the New Jersey Department of Environmental Protection (NJDEP) Treatment Works (TWA). The application package will include the following:

1. Treatment Works Approval Checklist for Administrative Completeness
2. Treatment Works Approval Permit Application
3. WQM 003 - Statements of Consent
4. WQM 006 - Engineer's Report for Domestic Treatment Works Approval Applications
5. DWR-175D - Domestic Wastewater Treatment System - Licensed Operator Grading Sheet
6. Construction Drawings
7. Specifications
8. Construction Cost Estimate and TWA review fees
9. Technical Design Report
10. Copies of Receipts of Public Notification from the Municipal Planning Board and the Municipal Environmental Commission.

We will make revisions requested by the NJDEP and the Borough during the review process. We are providing this task as an allowance as the level of effort is unknown at this time. We will make you aware of the requested revisions and prepare them as directed by your office.

Task 6. Construction Administration

Langan will respond to RFIs during construction and will review shop drawings and operation and maintenance manuals where required for the proposed Ion Exchange System. We have not included the review of substitutions as they may require significant effort. Instead, we propose that when the Contractor proposes a substitution, we would expect that the contract is written such that, the Contractor reimburses the Owner for the Engineers time to review the substitution.

Langan has included up to four (4) site visit observations for periodic inspections, preparing an initial punchlist walkthrough and one final punchlist walkthrough confirming all of the items have been completed to the satisfaction of the Engineer and/or Owner.

Langan will assist in the review of project close out documentation such as operations and maintenance manuals, warranty documents, and as-built drawings. This task as been included as an allowance because the scope is unknown at this time. We bill our time on a time and material basis and will advise you and provide a revised estimate if we exceed this allowance amount.

Task 7. Project Management and Meetings

This task is provided as an allowance for project oversight (technical and managerial), day-to-day general correspondence and clerical duties through the course of the project and attend meetings with you, the project team, and regulatory officials upon your request. An allowance has been provided, for up to four meetings attended by one senior Langan engineer. The allowance is based upon an assumed meeting time average of two hours each. Our invoicing for meeting attendance will be based on actual time spent.

FEE BUDGET ESTIMATE

Our estimated fee budget of services are provided below and are based on our knowledge of the work effort anticipated and our hourly rates in accordance with our Standard Schedule of Fees and Conditions on file with you. Reimbursable expenses will be itemized separately and include but are not limited to: express mailings, messenger service, reproduction for client use and team coordination, fees associated with information gathering, travel costs including mileage, tolls, taxi and parking, subsistence associated with evening meetings or travel.

EXCLUSIONS

Langan Task #	Description	Allowances/ Assumptions	Fee Budget
1	Pre-application meeting with the NJDEP	Budget	\$ 2,600
2	Existing Conditions Plan	Budget	\$ 11,900
3	Technical Design Report and Preliminary Layout Drawings	Budget	\$ 44,600
4	100% Construction Drawings	Budget	\$ 34,000
5	Permitting and Revisions Through Approval Process	Allowance	\$ 7,000
6	Construction Administration	Budget	\$ 22,900
7	Project Management and Meetings	Allowance	\$ 12,000
TOTAL FEE			\$ 135,000

Any work not explicitly described herein is excluded. Reimbursable expenses are not shown in the above tabulation. We suggest an allowance of \$600 for this purpose.

LANGAN is proceeding with the above described scope of services based on the below authorization. If notified to stop work on these services the client agrees to pay Langan for all work completed up to the stop work notification.



Agreement Authorized By: Scott Heck

for Langan: Gerard Fitamant, P.E.

cc: Michael Semeraro, Langan
 Rajeev Raina, Langan