



# City of Homer

[www.cityofhomer-ak.gov](http://www.cityofhomer-ak.gov)

Public Works

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## Memorandum 22-103

TO: City Council  
THROUGH: Rob Dumouchel, City Manager  
FROM: Janette Keiser, PE, Director of Public Works  
Todd Cook, Water/Sewer Superintendent  
DATE: May 24, 2022  
SUBJECT: WWTP Clarifier Belt Repairs

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**I. Issue:** The purpose of this Memorandum is to request funding to repair or replace the chain driven clarifier skimming systems at the Waste Water Treatment Plant (“WWTP”).

**II. Background:**

There are two clarifier tanks at the WWTP. Each tank is approximately 13’ 11” X 75’ X 12’ and contains about 94,000 gallons of waste water. The purpose of the tanks is to separate the liquids from the solids in order to meet permit requirements for discharge to Kachemak Bay. The clarifiers and all associated equipment were originally installed in 1990. These operate in a corrosive environment 24 hrs a day. A clarifier is only removed from service for routine maintenance. After maintenance is performed the unit is returned to service. Removal of solids from the waste stream is a critical part of the waste water treatment process in order to operate with permit regulations and the protection of Kachemak Bay.

The addition of a polymer and dissolved air into the waste stream cause the solid to bind together and float. These solids are then skimmed from the surfaces of the clarifiers by a chain-driven “skimmer” units. The skimmer units are approximately 65 feet long and are moving continuously, much the same way a bicycle chain moves, driven by a sprocket at both ends of the chain. The chain contains links, rollers and pins, from which 13 ft long skimmer flights hang. There are 33 flights per clarifier. Regular maintenance includes filling automatic oiler units to lubricate the chain drive links and rollers, oil changes on the drive gear box. Semiannual inspection are performed by draining and cleaning the clarifier so the skimmer system and sludge collection system, on the floor of tank, can be visually inspected. Chain tension is also adjusted as needed. Due to the units being over 35 years old and constantly exposed to an extremely corrosive environment the crew has noted excessive wear on the rollers, links and support pin for the flights.

Over the weekend, the unthinkable happened. A flight support pin failed and one of the flights, fell into the clarifier tank and caused the whole assembly to malfunction. The operators quickly stopped the chain drive to assess the damage and concluded this is not an easy fix. With repair parts, the crew was able to return the clarifier to service in a day. Due the wear, this will become a regular occurrence at the WWTP. We are increasing the amount of lubrication used and cleaning of the system in hopes

of buying more time until more repair parts or a replacement system can be found. Because of the age of the system, parts are hard to locate. We are having a local shop machine replacement pins. Installing new/ fabricated parts into 35 year old links and flights will, again, only buy some time. The entire system needs to be replaced.

The chain-driven skimmer units that City of Homer uses are not as common as the round clarifier tanks, which use different configurations of skimmer units. To fix our problem, we need to find a vendor who understands our particular technology. We have no idea who this would be yet.

We issued a Task Order to one of our Term Contract Engineers, RESPEC Company, Inc., which has a mechanical engineer based in Homer, to help us research options and engineer a solution. Not only for our broken clarifier but also for the other one, which actually has a much higher rate of operating hours on it. We asked RESPEC to bracket the likely costs ASAP, so we could seek an appropriation for funding the fix. The estimated cost is \$200,000 for each clarifier, for a total of \$400,000. Engineering fees are Engineering fees are \$22,840, for a total expenditure of are \$422,840.

Funding should come from the Sewer CARMA Fund, which is very low at this time, because (1) we've been working on other repairs and (2) we have not included the 15% capital reserve fee in the water/sewer rates for the past two years. We intended to re-introduce this fee in June 2022 so we could built up the Sewer CARMA Fund so we have the money to address problems like this. This clarifier belt problem got ahead of us. This is a fiscal issue we need to fix. We are operating with only one clarifier now and the other one must not be in good shape either. While this is not yet an emergency, we are living on borrowed time.

### **III. Recommendation:**

That the City Council appropriate funds from the Sewer CARMA Fund in the amount of \$422,840 to implement a solution to the broken clarifier belts in the WWTP.

CITY OF HOMER  
FINANCIAL SUPPLEMENT

PROJECT NAME	<u>WWTP Clarifier Belts Repair or Replacement</u>	DATE	<u>06/08/2022</u>
DEPARTMENT	<u>Public Works</u>	SPONSOR	<u>City Manager/PW Director</u>
REQUESTED AMOUNT	<u>\$ 422,840</u>		

DESCRIPTION	<p>One of the two clarifiers tanks at the Waste Water Treatment Plant (WWTP) broke recently, requiring repair or replacement to keep the City's waste water treatment process operating. We issued a Task Order in the amount of \$22,840 to one of our Term Contract Engineers, RESPEC Company, Inc. to help us research options and engineer a solution. The estimated cost is \$200,000 for each clarifier and engineering services in the amount of \$22,840 for a total of \$422,840.</p>
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FUNDING SOURCE(S)	OPERATING	GF CARMA	GF FLEET CARMA	PORT RESERVES	WATER CARMA
	0%	0%	0%	0%	0%
	HAWSP	HART-ROADS	HART-TRAILS	PORT FLEET RESERVES	SEWER CARMA
	0%	0%	0%	0%	100%

FUNDING SOURCE 1: SEWER CARMA	FUNDING SOURCE 2:	FUNDING SOURCE 3:
Current Balance <u>\$ 1,501,779</u>	Current Balance _____	Current Balance _____
Encumbered <u>\$ 703,515</u>	Encumbered _____	Encumbered _____
Requested Amount <u>\$ 422,840</u>	Requested Amount _____	Requested Amount _____
Other Items on Current Agenda <u>\$ 150,000</u>	Other Items on Current Agenda _____	Other Items on Current Agenda _____
Remaining Balance <u>\$ 225,424</u>	Remaining Balance _____	Remaining Balance _____
FUNDING SOURCE 4:	FUNDING SOURCE 5:	FUNDING SOURCE 6:
Current Balance _____	Current Balance _____	Current Balance _____
Encumbered _____	Encumbered _____	Encumbered _____
Requested Amount _____	Requested Amount _____	Requested Amount _____
Remaining Balance _____	Remaining Balance _____	Remaining Balance _____