

Department of Public Works

Bureau of Engineering  
Bureau of Sanitation  
Joint Report No. 1

April 26, 2024  
CD No. 11

**AUTHORIZATION TO UTILIZE THE CONSTRUCTION SERVICES CONTRACT AND SOLE SOURCE THE LINDE GROUP FOR FINAL INSPECTION AND ANALYZER PACKAGE SYSTEM FOR THE CAPITAL IMPROVEMENT PROJECT 8206 HYPERION WATER RECLAMATION PLANT CRYOGENIC FACILITY COLD BOX NO. 2 REHABILITATION (WORK ORDER NO. SZH12251)**

**RECOMMENDING THE BOARD OF PUBLIC WORKS (BOARD):**

1. AUTHORIZE the City Engineer to use the construction services contract (CiSCo) and to issue Task Work Orders (TWO) to the contractor for an amount not-to-exceed \$1,594,000 for the Capital Improvement Project (CIP) 8206 Hyperion Water Reclamation Plant (HWRP) Cryogenic Facility Cold Box No. 2 Rehabilitation (Project).
2. AUTHORIZE the Director and General Manager of the Los Angeles Sanitation and Environment (LASAN) to request the City Engineer to sole source the Linde Group (Linde) for the final inspection of Cold Box No. 2 for an amount not-to-exceed \$235,000 and sole source procurement of the analyzer package system designed and packaged by Linde for an amount not-to-exceed \$215,000.

**TRANSMITTAL**

A copy of adopted board report CIP 8156 HWRP Cryogenic Facility Cold Box 1 and 2 Improvements, authorization to utilize CiSCo and sole source Linde for final inspection dated February 22, 2019, for an amount not-to-exceed \$2,750,000 (Work Order No. SZH11891).

**DISCUSSION**

***Background***

In 1994, the HWRP was upgraded to incorporate the use of High-Purity Oxygen Activated Sludge in the full secondary treatment of its wastewater. This process requires pure oxygen to be mixed into the secondary influent within the aeration basins, where it helps the microbes to digest the biological solids within the sewage. This 98 percent pure gaseous oxygen is produced onsite using a cryogenic air separation process, which is a low-temperature rectification process to produce oxygen and nitrogen. The Cryogenic Facility at the HWRP includes three – 250 tons per day cryogenic oxygen generating plants, referred to as Cold Box Nos. 1 through 3. These plants generate gaseous oxygen for pipeline distribution to the HWRP secondary activated sludge process and nitrogen for in-plant use. Linde Engineering of the Linde Group is the designer and the supplier of the HWRP Cryogenic Facility.

The LASAN operates and maintains the HWRP Cryogenic Facility which is almost 30 years old and is due for rehabilitation. An Initial Technical Assessment Study for the HWRP Cryogenic Facility was completed over 2015-2016 by Linde. The study included recommendations to improve and extend the equipment and facilities life by 15-20 years including replacement of insulation material (perlite), and inspection of the cold boxes to define a refurbishing scope or replacement.

Operating conditions required Cold Box No. 3 to be shut down for maintenance and Cold Box No. 2 to be kept online, as such the inspection and refurbishment of Cold Box No. 1 and No. 3 was completed as a part of CIP 8156 HWRP Cryogenic Facility Cold Box 1 and 2 Improvements (Transmittal). The Cryogenic Facility Cold Box No. 2 will be inspected and rehabilitated under this project, CIP 8206. The location of all three cold boxes is shown in the Figure below:

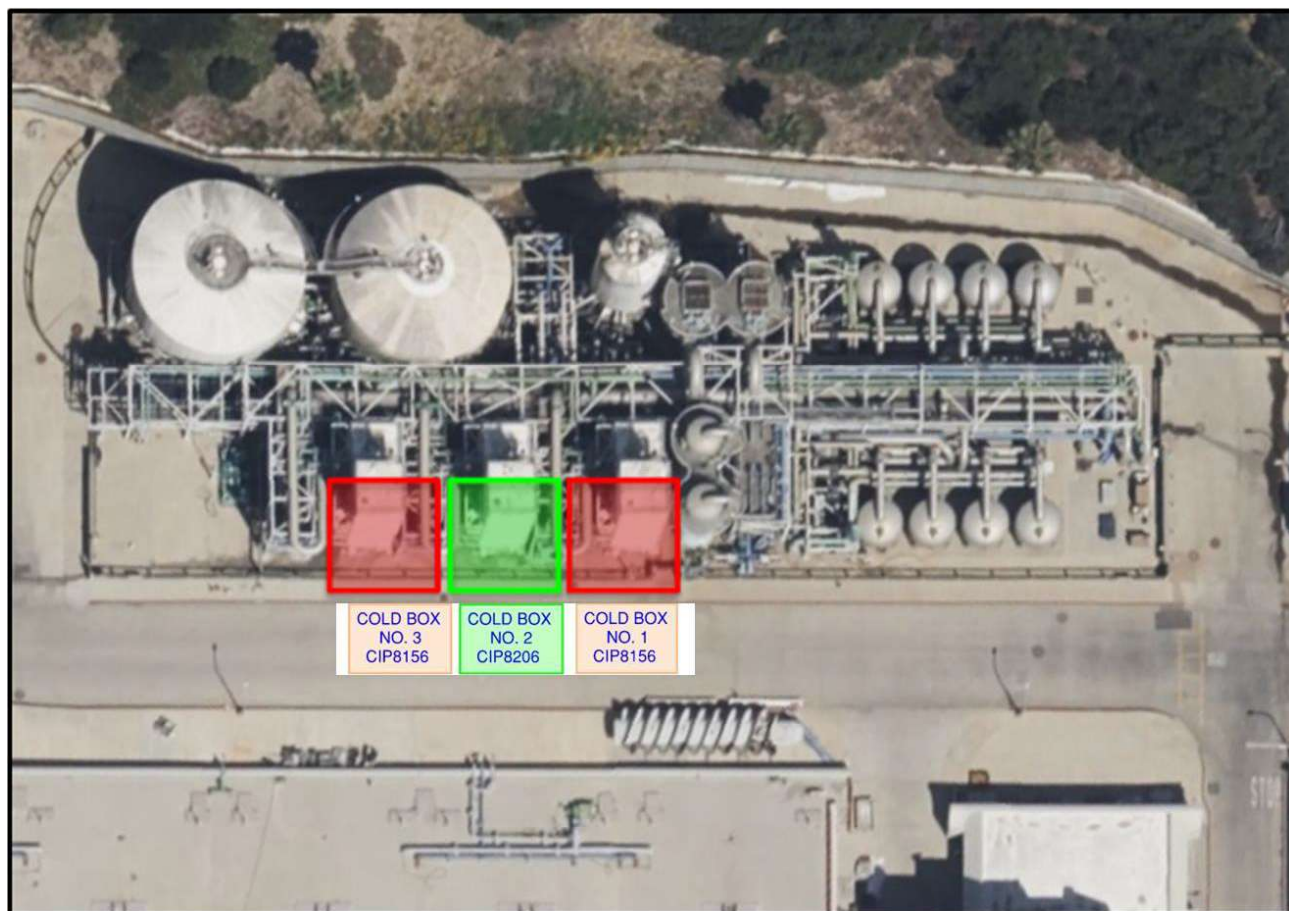


Figure: Cold Box Nos. 1, 2, and 3

To inspect the condition of the Cold Box internals and make repairs, positive isolation of the cold box from the Cryogenic Facility is required and the insulation material perlite needs to be removed. The cold boxes use expanded perlite as thermal insulation. Some of the perlite

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may have compacted over time, compromising the thermal performance and the structural integrity. Perlite is inert volcanic glass that forms a lightweight powder aggregate when expanded by heat. Perlite is a highly effective insulating material used to reduce refrigeration losses or heat leak into the cold box, which would otherwise reduce production and increase power consumption. Perlite replacement is specialty work and requires special equipment and an experienced contractor.

To get access to the equipment, scaffolding needs to be erected as well as lighting and ventilation inside the Cold Box. All aspects of safety, health, environment, and quality will be addressed prior to the start of inspection. The contractor will provide a monitoring and rescue team to oversee safety and emergency rescue of confined space entrants.

### ***Proposed CiSCo Project***

The CIP 8206 HWRP Cryogenic Facility Cold Box No. 2 Improvement proposes to improve the infrastructure at the HWRP by inspecting and rehabilitating Cryogenic Facility Cold Box No. 2.

The scope of work includes the following:

- a) Positively isolate Cold Box No. 2 from the Cryogenic Facility
- b) Install scaffolding, lighting, and ventilation
- c) Remove and replace perlite
- d) Inspect Cold Box No. 2 structures and equipment
- e) Rehabilitate Cold Box No. 2 per the result of inspection

### ***Sole Source Justification***

To implement the project, the Bureau of Engineering (BOE) and the LASAN therefore recommend to sole source Linde for inspections by qualified experts, as well as the diagnosis of essential Cold Box No. 2 components for refurbishing and replacement. This is highly specialized work and Linde is the original designer and supplier of the cold boxes and thus uniquely suited to perform this specialty diagnostic and repair work on its own equipment.

### ***CiSCo Justification***

To minimize the risk of Cryogenic Facility failure that may impact the plant's operation and employee safety, it is critical to implement the Project immediately. To complete this work on an accelerated schedule, the Bureau of Engineering intends to issue negotiated TWO's through CiSCo to rehabilitate Cryogenic Facility Cold Box No. 2. The scope of work requires extensive coordination with HWRP staff to facilitate necessary shutdowns of the treatment process. Carrying out this highly specialized work with multiple facility shutdowns and

coordination using the CiSCo contract will make it possible to deliver the project in the most efficient manner. The CiSCo contract is well suited for such work that requires close coordination with the plant staff to schedule process shutdowns based on plant operations.

The projected duration for the completion of the work is 18 weeks: 10 weeks for preparation and eight weeks for the scheduled work. The estimated costs are shown in the following table:

<b>Table</b>		
<b>Item</b>	<b>Description</b>	<b>Cost</b>
1	Rehabilitate Cold Box No. 2 including aluminum welding, piping supports, piping integrity testing and repairs, valves, and instrumentation.	\$ 500,000
2	Remove and replace perlite insulation	\$ 300,000
3	Access system for inspection of Cold Box No. 2	\$ 175,000
4	Inspection of Cold Box No. 2 by Linde	\$ 235,000
5	Analyzer package system design and packaged by Linde	\$ 215,000
Construction Contingency		\$ 169,000
<b>Total Project Construction Cost</b>		<b>\$1,594,000</b>

***Program Review by Committee (PRC) Approval***

The project budget was approved by PRC on July 12, 2023, in the amount of \$1,594,000.

**STATUS OF FINANCING**

There is no impact to the General Fund. The total funding for this project is not to exceed \$1,594,000. Funding for Fiscal Year 2023-24 in the amount of \$1,000,000 is available in the Fund No. 70X, Wastewater System Commercial Paper B Construction Fund, Department No. 50, Appropriation Unit No. 50YDCF, HWRP Cryogenic Cold box No. 2 Rehabilitation. The remaining funding will be budgeted within the Sewer Construction and Maintenance Fund.

Funds and appropriations for future fiscal years are not yet identified and existing appropriations may change based on available cash balances. Therefore, funds and appropriations will be determined by the Director and General Manager of LASAN.

Funding as of the date of this Board Report has been verified and approved by the Director of the Office of Accounting subject to terms and conditions and cash availability described above.

The City's liability under this contract shall only be to the extent of the present City appropriation to fund the contract. However, if the City shall appropriate funds for any succeeding years, the City's liability shall be extended to the extent of such appropriation, subject to the terms and conditions of the contract.

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( EBW RMK AM SB RL )

Report reviewed by:


BOE (ADM) and  
BOS (HWRP, FMD, and RL)

Report prepared by:


Environmental Engineering Division

Ethan B. Wong, PE, ENV SP  
Division Engineer  
Phone No. (310) 648-6120

Statement as to Funds approved by:

  
Sarai Bhaga (Apr 4, 2024 13:54 PDT)

Sarai Bhaga, Chief Financial Officer  
Bureau of Sanitation  
Date: \_\_\_\_\_

  
\_\_\_\_\_  
Miguel De La Peña, Director  
Office of Accounting  
Fund Ref.70X/50/50YDCF \$1,000,000  
Date: 4/08/2024

EBW/SDH/NS/11-2023-0167\_EED.pnc

Questions regarding this  
report may be referred to:  
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Email: nadir.shah@lacity.org

Respectfully submitted,



For Ted Allen, PE  
City Engineer  
Bureau of Engineering



Barbara Romero  
Director and General Manager  
Bureau of Sanitation

Department of Public Works


Bureau of Engineering  
Bureau of Sanitation  
Joint Report No. 2

February 22, 2019  
CD No. 11

ADOPTED BY THE BOARD  
PUBLIC WORKS OF THE CITY  
of Los Angeles California

FEB 22 2019

BPW-2019-0138

  
Executive Officer  
Board of Public Works

**CAPITAL IMPROVEMENT PROJECT (CIP 8156), HYPERION WATER RECLAMATION PLANT (HWRP) CRYOGENIC FACILITY COLD BOX NOS. 1 AND 2 IMPROVEMENTS, AUTHORIZATION TO UTILIZE A CONSTRUCTION SERVICES CONTRACT (CISCO) AND SOLE SOURCE THE LINDE GROUP (LINDE) FOR FINAL INSPECTION (WORK ORDER NO. SZH11891)**

#### RECOMMENDATIONS

1. Authorize the City Engineer to use a CiSCo and to issue Task Work Orders to the contractor for an amount not-to-exceed \$2,750,000 for the HWRP Cryogenic Facility Cold Box 1 and 2 Improvements project.
2. Authorize the City Engineer to sole source with the Linde team of qualified experts, to accomplish the cold box improvements and for the final inspection of Cold Box Nos. 1 and 2 engineered and manufactured by Linde.

#### DISCUSSION

##### ***Background***

The HWRP in 1994 was upgraded to incorporate High-Purity Oxygen Activated Sludge, full secondary treatment of its wastewater. This 98 percent pure gaseous oxygen is produced onsite using a cryogenic air separation process, which is a low-temperature rectification process to produce oxygen and nitrogen. The Cryogenic Facility at the HWRP includes three - 250 tons per day cryogenic oxygen generating plants, Cold Box Nos. 1 through 3. These plants generate gaseous oxygen for pipeline distribution to the HWRP secondary activated sludge process and nitrogen for in-plant use. Linde Engineering of the Linde Group is the designer and the supplier of the HWRP Cryogenic Facility.

The Los Angeles Sanitation (LASAN) operates and maintains the HWRP Cryogenic Facility. The LASAN is requesting Bureau of Engineering (BOE) to implement improvements and rehabilitation of the existing Cryogenic Facility. The facility is approximately 24 years old and is due for life extension rehabilitation. Initial Technical Assessment Study for the HWRP Cryogenic Facility was completed in 2015-2016 by Linde. The study recommended solutions to improve and extend the equipment and facilities life cycle by 15-20 years. including replacement of insulation material (perlite), and inspection of the cold boxes to define a refurbishing scope or replacement.

Transmittal

To inspect the condition of the cold box internals and make repairs, positive isolation of the cold box from the Cryogenic Facility is required and the isolation material perlite needs to be removed. The cold boxes use expanded perlite as thermal insulation. Some of the perlite may have compacted over time, compromising the thermal performance and the structural integrity. Perlite is inert volcanic glass that forms a lightweight powder aggregate when expanded by heat. Perlite is a highly effective insulating material used to reduce refrigeration losses or heat leak into the cold box, which would otherwise reduce production, increase power consumption, or both. Perlite replacement is a specialty work and requires special equipment and an experienced contractor.

To gain access to the equipment, scaffolding needs to be erected as well as lighting and ventilation inside the cold box. All aspects of SHEQ (safety, health, environment and quality) Guidelines will be addressed prior to start of inspection. The contractor will provide a monitoring and rescue team to oversee safety and emergency rescue of confined space entrants.

#### ***Proposed CiSCo Project***

The HWRP Cryogenic Facility Cold Box Nos. 1 & 2 Improvement project will positively isolate Cold Box No. 1 and Cold Box No. 2 from the Cryogenic Facility sequentially, for perlite removal, disposal of removed perlite, procurement and installation of new perlite. The Project also provides for inspection of the Cold Box Nos. 1 and 2 structures and equipment to make necessary repairs. The contractor will provide temporary scaffolding for required access locations, lighting and ventilation, provides monitoring and rescue team for the Linde inspection team confined space entry and perlite subcontractor, to oversee safety and rescue of confined space entrants and comply with Occupational Safety and Health Administration SHEQ Guidelines. Cold Box No. 3 will be upgraded as part of a larger overall Cryogenic rehabilitation project to be completed at a later date.

#### ***Sole Source Linde Team of Qualified Experts Justification***

To implement the project, the BOE and the LASAN therefore recommend to sole source with the Linde team of qualified experts for the inspections, as well as the diagnosis of essential Cold Box Nos. 1 and 2 components for refurbishing and replacement. This is a highly specialized work and Linde is the original designer and supplier of the cold boxes.

#### ***CiSCo Justification***

To implement the project, the BOE intends to issue negotiated task work orders to the CiSCo contractor. Projected duration for the completion of the work is 18 weeks: 10 weeks for preparation and 8 weeks for the scheduled work. Carrying out this highly specialized work under an accelerated schedule while meeting operational requirements would be very challenging under a conventional bid and award process. Using the CiSCo contract partnered with the LASAN HWRP Operations and Maintenance team will make it possible to deliver the project in a timely and effective manner.

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***Engineer's Recommendation***

The City Engineer and Director of LASAN recommends that the Board of Public Works authorize the use of the CiSCo and to issue Task Work Orders to the contractor for an amount not-to-exceed \$2,750,000 for the HWRP Cryogenic Facility Cold Box Nos. 1 and 2 Improvements project.

***Program Review Committee (PRC) Approval***

The PRC approved a total budget not-to-exceed \$2,750,000 for this project on October 10, 2018.

**STATUS OF FINANCING**

There is no impact to the General Fund. The total funding for this project is not-to-exceed \$2,750,000. Funding for Fiscal year 2018-19 in the amount of \$681,000 is available in the Sewer Capital Fund, Fund No. 761, Department No. 50, Appropriation Unit No. 50RDJ6. The remaining funds will be budgeted within the Sewer Construction and Maintenance Fund, as shown in the table below:

<b>Fund No.</b>	<b>Appropriation Unit No.</b>	<b>Budget Fiscal Year</b>	<b>Contract</b>	<b>Total</b>
761	50RDJ6	FY 2018/19	\$ 681,000	\$ 681,000
TBD	WCIP Budget	Future	\$2,069,000	\$2,069,000
<b>Total</b>			<b>\$2,750,000</b>	<b>\$2,750,000</b>

However, funds and appropriations for future fiscal years are not yet identified and existing appropriations may change based on available cash balances. Therefore, funds and appropriations will be determined by the Director of Sanitation or designee.

The contract contains a "Financial Liability Clause" that states that "the City's liability under this contract shall only be to the extent of the present City appropriation to fund the contract. However, if the City shall appropriate funds for any succeeding years, the City's liability shall be extended.

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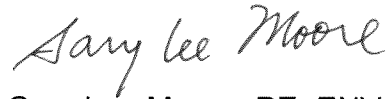
( MJS RMK KRR AKN TJM )

Report reviewed by:

Respectfully submitted,

BOE (ADM) and LASAN (HWRP and FMD)

Report prepared by:



Gary Lee Moore, PE, ENV SP  
City Engineer  
Bureau of Engineering

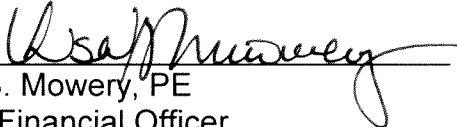
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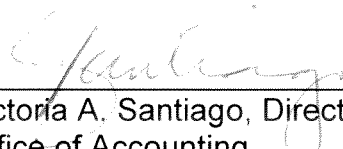
Statement as to Funds approved by:



Enrique C. Zaldivar, PE  
Director and General Manager  
Bureau of Sanitation



Lisa B. Mowery, PE  
Chief Financial Officer  
Bureau of Sanitation



Victoria A. Santiago, Director  
Office of Accounting  
Fund Ref. 761/50/50RDJ6/\$ 681,000  
WCIP Budget/Future/\$2,069,000  
Total \$2,750,000

Date: 11.28/19

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Questions regarding this report  
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