

# **Environmental Impact Assessment - Cold Operations**

**Polar Dynamics Robotics, Inc.**

**Assessment Date: January 11, 2024**

**Document Reference: EIA-2024-001**

## **1. Executive Summary**

This Environmental Impact Assessment evaluates the environmental implications of Polar Dynamics Robotics, Inc.'s ("PDR") cold operations facilities and autonomous mobile robot (AMR) manufacturing processes. The assessment focuses on the company's 85,000 sq. ft. manufacturing facility located at 2175 Innovation Drive, Dover, Delaware, and its 40,000 sq. ft. cold testing facility at 890 Industrial Park Road, Dover, Delaware.

## **2. Scope of Assessment**

1. This assessment covers:

- Manufacturing operations for cold-resistant AMR units
- Cold environment testing facilities (-40 C to +25 C range)
- Thermal management system production
- IceNav(TM) calibration operations
- Chemical storage and handling
- Waste management processes
- Energy consumption and refrigeration systems

2. Assessment Period:

January 1, 2023 - December 31, 2023

## **3. Regulatory Compliance Framework**

1. Federal Regulations:

- Clean Air Act (42 U.S.C. 7401 et seq.)
- Clean Water Act (33 U.S.C. 1251 et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.)

2. State Regulations:

- Delaware Environmental Control Regulations
- Delaware Industrial Development Act
- Delaware Air Quality Management Act

## **4. Environmental Impact Analysis**

### **1. Air Quality Impact**

- Refrigerant emissions: 2.8 metric tons CO<sub>2</sub>e annually
- VOC emissions from coating processes: 0.5 tons annually
- Particulate matter emissions: Below reportable threshold
- All emissions within permitted limits under Title V permit #DE-AQ-2022-156

### **2. Water Usage and Discharge**

- Annual water consumption: 1.2 million gallons
- Industrial wastewater discharge: 850,000 gallons
- Compliance with NPDES Permit #DE0023445
- Zero reportable discharge violations

### **3. Waste Management**

- Hazardous waste generation: 1.2 tons annually
- Electronic waste recycling: 3.5 tons annually
- Metal scrap recycling: 12.4 tons annually
- EPA Handler ID: DER000785421

### **4. Energy Consumption**

- Total facility power usage: 4.8 million kWh annually
- Cold facility specific usage: 2.1 million kWh annually
- Peak demand management system implemented
- Energy Star certification maintained

## **5. Mitigation Measures**

### **1. Current Mitigation Strategies**

- Closed-loop refrigerant recovery system

- Energy-efficient LED lighting throughout facilities
- Variable frequency drives on all major motors
- Heat recovery systems for facility heating
- Water recycling system for testing operations

## 2. Planned Improvements

- Solar panel installation (Q2 2024)
- Advanced building management system upgrade
- Enhanced refrigerant monitoring system
- Water usage optimization program

## 6. Environmental Management System

### 1. ISO 14001:2015 Certification

- Certification Number: ISO14001-2023-PDR-001
- Last Audit Date: November 15, 2023
- Next Audit Due: November 15, 2024

### 2. Environmental Policy Implementation

- Quarterly environmental performance reviews
- Employee environmental training program
- Supplier environmental compliance requirements
- Emergency response procedures

## 7. Monitoring and Reporting

### 1. Continuous Monitoring Systems

- Air quality monitoring stations
- Energy management system
- Water quality monitoring
- Refrigerant leak detection

### 2. Reporting Requirements

- Monthly environmental compliance reports

- Quarterly emissions reporting
- Annual environmental performance review
- Incident reporting protocol

## **8. Certification**

This Environmental Impact Assessment has been prepared in accordance with applicable federal and state regulations. The undersigned certifies that the information contained herein is true and accurate to the best of their knowledge.

Prepared by:

Environmental Health & Safety Department

Polar Dynamics Robotics, Inc.

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Katherine Wells

Chief Financial Officer

Date: January 11, 2024

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Dr. Marcus Chen

Chief Technology Officer

Date: January 11, 2024

## **9. Disclaimer**

This assessment is based on current operations and available data. Future modifications to operations or regulatory changes may require updates to this assessment. This document is confidential and proprietary to Polar Dynamics Robotics, Inc. and may not be reproduced or distributed without written authorization.