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Submitted electronically to the "acf-comments-ws" docket

October 28, 2021

Mr. Craig Segall
Deputy Executive Officer
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Dear Mr. Segall:

Subject: LADWP Comments on the Draft Advanced Clean Fleets Regulatory Language

The Los Angeles Department of Water and Power (LADWP) appreciates the opportunity to provide comments on the Advanced Clean Fleets (ACF) draft regulatory language for public fleets.

LADWP is the nation's largest municipal utility serving more than 4 million residents of Los Angeles, its businesses, and visitors. LADWP maintains a vast water system with about 7,340 miles of mainlines and trunk lines transporting 159 billion gallons of water annually. LADWP's Power System is the nation's largest municipal electric utility supplying over 21,130 gigawatt hours annually to customers in Los Angeles and the Owens Valley. In addition, LADWP maintains a diverse power generation, transmission, and distribution system of 15,000 miles of power lines and cables that span five Western states. Operating and maintaining these vast systems requires necessary vehicles readily available to quickly restore water and power.

LADWP recognizes the leadership of the Governor, with the hallmark Executive Order N-79-20, and supports CARB's goals to reduce the transportation sector's greenhouse gas (GHG) emissions through the ACF regulation and overall efforts to meet the state's electrification targets. LADWP itself is committed to facilitating the adoption of transportation electrification in Los Angeles. As of January 2021, LADWP, in collaboration with other departments of the City of Los Angeles, has installed over 10,000 commercial EV charging stations, providing Los Angeles with the most charging stations of any other city in the United States and facilitating its residents and businesses to make the switch to zero-emission vehicles (ZEVs). Los Angeles is on track to meet its future goals of 25,000 commercial charging stations by 2025 and 28,000 stations by 2028. These efforts are instrumental in meeting Los Angeles' sustainability goal to convert all city fleet vehicles to zero-emission where technically feasible by 2028.

LADWP has a medium- and heavy-duty (MHD) fleet size of approximately 4,900 diesel, gasoline, and natural gas vehicles. Appendices 1 and 2 provide detailed descriptions and photographs of LADWP's specialty vehicles and their respective applications. These vehicles perform critical functions at a moment's notice such as responding to downed high-power

voltage lines or damaged trunk lines flowing thousands of gallons of water. LADWP needs these specialty vehicles to quickly address these situations, which are not only service disruptions but are often threats to public health and safety.

LADWP has been actively looking to expand its fleet to include ZEVs and near-zero-emission vehicles (NZEVs) by engaging with manufacturers and pilot testing MHD ZEVs. In the last two years, LADWP has tested a Trans Power Class 8 tractor and a Lightning Box Van. LADWP was recently involved in testing and collecting data on a ROUSH CleanTech all-electric Ford F-650 stake bed demo unit. LADWP has yet to test prototypes that meet the rigorous demands of LADWP's water and power operations. In the meantime, LADWP continues to provide proprietary feedback and data to the manufacturers in the hopes of contributing to the continued development of these vehicles. LADWP has also committed to purchasing 100 Ford F-150 Lightning electric pickup trucks as soon as they become available. Additionally, LADWP is willing to partner with CARB on future pilot tests and other efforts promoting the use of ZEVs and NZEVs.

While LADWP supports CARB's electrification goals and is committed to electrification efforts wherever feasible, LADWP requests CARB to take into account the following considerations and recommendations for the proposed draft ACF regulation:

1. LADWP is a Provider of Essential Public Service (PEPS) and operates a large MHD fleet of specialty utility vehicles needed to maintain reliable water and power throughout LADWP's extensive service territory.
    a. The unavailability of ZEV specialty vehicles could impact LADWP's role as a PEPS.
    b. A restrictive and infeasible exemption process can deter LADWP's ability to restore essential services during emergencies.
2. LADWP recommends the following:
    a. Develop an independent technology review panel to make yearly commercialization determinations.
    b. Defer the purchase requirements for Class 7-8 vehicles until the technology review panel determines that suitable ZEVs are commercially available.
    c. Adjust the 75% ZEV threshold requirement for an exemption based on the technology review panel's determinations.
    d. Clearly define the exemption criteria and process to ensure the reliability of emergency response vehicles.
    e. Include early action credits in the draft regulation language to incentivize the development and adoption of ZEVs.

Considerations for Providers of Essential Public Services

As part of LADWP's efforts to transition to ZEVs, providing safe and reliable water and power services to its customers remains LADWP's highest priority. As a PEPS defined under Title 13, California Code of Regulations, Section 2452, LADWP's primary purpose is to operate and maintain its facilities and equipment to ensure the continued supply and delivery of essential water and power services to the communities it serves. LADWP requests that CARB consider the critical and unique role as a PEPS, especially electric utilities that need specialty vehicles to carry out operations and maintain infrastructure that is crucial in supporting electric ZEVs.

Though California law doesn't specifically categorize utility vehicles as "emergency vehicles", they do serve to protect the public from threats of health and safety. For this reason, LADWP requests that CARB consider specialty vehicles in these critical roles. Public utility vehicles that work to restore utility services during an outage or emergency scenario should include "[a]ny vehicle . . . equipped and used either for fighting fires, or towing or servicing other vehicles, caring for injured persons, or repairing damaged lighting or electrical equipment." Cal. Veh. Code, § 165. Furthermore, the human right to water should be considered when "revising, adopting, or establishing policies, regulations, and grant criteria" that impact water used for domestic purposes. Cal. Health & Saf. Code, § 42352; Cal. Wat. Code, § 106.3 (AB 685 (2012)).

LADWP encourages CARB to consider the impact the ACF regulation would have on the ability of utilities to fulfill their critical role of protecting against threats to public health and safety. A regulation that requires the purchase of ZEVs when they are not yet available or recommends that public fleet owners/operators wait to replace older vehicles could significantly impact PEPS' roles.

Vehicle Availability

LADWP encourages CARB to recognize the importance of vehicle availability and the impact of the unavailability of ZEVs on public fleet operations. LADWP fully supports ZEV technologies, but recognizes that ZEVs are not yet suitable for LADWP's PEPS operations. LADWP hopes that the MHD ZEV technology will improve as quickly as CARB anticipates, and requests an ability to purchase a new vehicle if a ZEV or NZEV is not commercially available.

Additionally, due to the COVID-19 pandemic, the resulting global microchip shortage is affecting a variety of industries, including automakers. Manufacturers have stated that they are reducing production and have started to implement fleet order cutoffs for select vehicle lines, anticipating more cutoffs in the future. Manufacturers will likely need a few years to fulfill the backorders, which could delay the development of new ZEV technology. Although the regulation will not take effect until 2024, it is uncertain how long the pandemic's effect on the economy will last. Additionally, when the ACF regulation is passed, ZEV manufacturers will likely be overwhelmed with high volumes of purchase orders, which could impact both the production schedule and associated costs. Requiring ZEV purchases without regard to vehicle availability and supply constraints could further delay the much needed replacement of older vehicles.

Furthermore, LADWP would like CARB to consider some issues raised regarding ZEV warranty support. LADWP was recently informed by a manufacturer that they currently do not have technicians who are trained to service new vehicle entrants into the all-electric MHD market. They admitted that they would not be able to provide warranty support in the short term.

It is also important to note that public fleets have unique public procurement processes and restrictions which involve the evaluation of "responsive" bids from "responsible" bidders. Even if a ZEV is commercially available, a public fleet may not be able to purchase the vehicle if it does not receive bids that meet the required technical specifications from at least two responsible and reliable suppliers. It is important to recognize that receiving a bid for a vehicle does not guarantee that the vehicle will be delivered, delivered on time, or be able to perform as advertised. LADWP encourages CARB to incorporate safeguards in the regulation to ensure vehicle manufacturers are providing reliable vehicles.

Recommendations:

Technology Review Panel & ZEV Database

LADWP supports the idea of an independent technology review panel consisting of subject matter experts authorized to make yearly commercialization determinations. The technology review panel would ensure that particular ZEVs are available for purchase, can be delivered within a reasonable amount of time, and have demonstrated that they are capable of meeting the specifications, duty cycles, and performance requirements of existing conventional-fueled vehicles. LADWP also supports the idea of CARB developing a list or database of commercially available ZEVs and NZEVs based on the technology review panel's findings. By informing fleet owners/operators on available options, the technology review panel's recommendations would help streamline the procurement process, as well as the exemption process, especially in the initial years of the regulation.

The technology review panel should be made of experts representing public fleets, private fleets, OEMs, industries, and stakeholders. The technology review panel should make yearly ZEV determinations to provide fleet owners/operators certainty when planning their vehicle purchases. Purchase requirements can be adjusted if the technology review panel determines that certain ZEV classes are not commercially available or that available ZEV alternatives do not match the specifications or operability of its conventionally fueled counterparts.

Class 7-8 ZEVs Purchase Requirements

LADWP suggests deferring the public fleet purchase requirements for Class 7-8 vehicles until the technology review panel determines that viable ZEV alternatives are available in the market. Class 2b-6 vehicles are more capable of transitioning to electric vehicles, but Class 7-8 vehicles will be much more difficult to electrify. They may require fuel cell or fuel cell hybrid technology, which will likely take more time to develop and deploy among Class 7-8 vehicles. The technology review panel should be able to advise on when public fleets can start complying with the proposed purchase requirements based on its market analysis.

CARB Certification

Additionally, LADWP supports requiring ZEV manufacturers to obtain CARB certification for power efficiency, warranty, and durability beginning in 2024. LADWP requests that extensive testing be required to demonstrate ZEV performance under real-world conditions similar to those that a utility fleet vehicle is subject to in the field. The technology review panel should develop minimum qualifications with oversight from CARB. For example, the vehicles should have a proven track record of operating in a commercial fleet environment for a minimum of two years, travel a total of at least one million miles (which may be equivalent to 10 vehicles traveling 100,000 miles each) within that period, and have a 90% service reliability or availability rate (approximately 325 out of 365 days each year).

Exemptions for Emergency Response

LADWP requests that CARB keep the aforementioned essential services in mind when developing the public fleet exemptions for emergency response. In the event of an emergency, LADWP must be ready to respond at a moment's notice and restore essential water and power

services as quickly as possible. This requires dispatching reliable vehicles throughout LADWP's large service territory, and ensuring adequate fuel or power for the vehicles to travel over long distances and operate for extended periods on the job site. LADWP's service territory has been and continues to be subjected to a variety of natural disasters including wildfires, earthquakes, heat storms, and wind storms, with the most severe natural disaster predicted to be a major earthquake, similar or greater than the 6.7 magnitude Northridge Earthquake in 1994.

LADWP appreciates the inclusion of an exemption process under Section 95693.2 (a) that would allow the purchase of non-ZEVs and/or non-NZEVs. However, the first exemption requirement that "more than 75 percent of that body type in the fleet are already ZEVs" will be challenging or even impossible to meet in the near term. At this time, there are currently no ZEVs and NZEVs that meet LADWP's operational needs, and it is unknown when such vehicles will be available. With a current MHD fleet size of approximately 4,900 diesel, gasoline, and natural gas vehicles, LADWP would take a long time before qualifying for an exemption. In the meantime, old vehicles will inevitably need to be replaced.

LADWP's fleet is composed of highly customized vehicles with unique specifications required for LADWP's field operations. These include repairing electrical and water distribution networks where equipment may operate well over 12 hours. Other instances require vehicles to travel long distances throughout LADWP's large service territory, which stretches from the Los Angeles basin to other parts of California, Nevada, and Utah, sometimes well over 600 miles. These vehicles are typically heavier than conventional light-duty trucks, sometimes weighing up to 115,000 pounds. Currently, only diesel, gasoline, and some natural gas MHD vehicles are suitable to meet the needs of LADWP.

As previously stated, LADWP has pilot-tested different body types of ZEVs from different manufacturers but has yet to find a ZEV/NZEV that is capable of operating for extended periods out in the field. Some of the jobs for which the ZEVs were being tested could not be completed without having to recharge the vehicles. The MHD ZEVs currently available in the market do not match the performance and specifications of existing MHD vehicles and could hinder LADWP's ability to perform routine services and respond to emergencies.

Additionally, CARB's proposed exemption prerequisite to have 75% of a body type be ZEV is not operationally feasible. For example, LADWP's patrol trucks are dispatched to investigate power outages and issues along LADWP's transmission and distribution lines. Because they travel long distances to remote locations, they are not suitable as ZEVs. Requiring 75% of that body type to be ZEVs would limit the functions of a majority of LADWP's patrol trucks. This could easily apply to other types of utility vehicles that are expected to be available in the event of an emergency, such as the case with LADWP. Since LADWP does not have a specific set of vehicles designated for emergency-only purposes, all LADWP vehicles are considered emergency response vehicles and are relied on to respond to emergencies within California and sometimes outside the state. For example, the 1994 Northridge Earthquake was an all-hands-on-deck situation, and every single vehicle was deployed to assist first responders and restore water and power.

Furthermore, LADWP has numerous formal mutual assistance agreements with other agencies and associations such as American Public Power Association, California Disaster and Civil Defense, California Utilities Emergency Association, California Water Wastewater Agency Response Network, Mult-Agency Water, and Western Region (Electric and Natural Gas).

LADWP has participated in mutual aid requests when feasible. A complete transition to ZEVs may limit LADWP's ability to provide mutual aid if charging infrastructure is not available in regions where mutual aid is requested.

Recommendations:

LADWP recommends that, based on the findings from the technology review panel, the implementation start date of the requirement for 75% of a body type to be ZEV be adjusted until viable ZEV alternatives are available. In the meantime, LADWP encourages CARB to consider exemptions based on the limitations of emergency services if the available ZEV alternative does not meet the needs of the fleet. LADWP requests that more reasonable accommodations be provided for public fleet vehicles that provide emergency response services.

LADWP suggests that CARB adopt a technical infeasibility exemption concept and allow fleet owners/operators the opportunity to apply for an exemption if a ZEV is unable to meet operational needs. LADWP recommends that criteria for technical infeasibility be well-established before rule adoption and that CARB provide a determination within a maximum of 90 days. LADWP is open to working with CARB to further develop the exemption process.

LADWP suggests that exemptions be granted if any one of the following conditions applies:

- Fleet owners/operators are able to demonstrate that no engine and chassis or body configuration is commercially available to perform a specific application due to any of the following:
    - Unavailability of vehicles that fit a fleet's specifications.
    - 1:1 ZEV replacement is not available, which would require fleets to operate and maintain additional vehicles for a specific operation.
    - ZEVs require the wheelbase to be extended, which would impact operations. This is especially critical when navigating through narrow streets with steep elevations in very high fire hazard severity zones, or over rough terrains in remote areas.
    - ZEVs would exceed the legal allowable weight specified by the Department of Transportation or the Federal Motor Carrier Safety Administration. Specialty vehicles are often required to have additional attachments for safety and operability that traditional vehicles may not require.
- Charging infrastructure is not commercially available within a reasonable number of miles from the locations where vehicles will operate.
- Fleet owners/operators are unable to receive bids for ZEVs from responsive and reliable bidders.
- ZEVs could not be delivered on time due to significant manufacturer delays/lead times.

To help further reduce emissions, CARB can encourage public fleet operators to fund programs that would offset the incremental increase in GHG emissions between an electric vehicle and a conventionally fueled vehicle.

Additional Comments

Early Action Credits

With LADWP ready to purchase ZEVs that fit LADWP's operational needs as soon as they become commercially available, LADWP is very open to the concept of early action credits. LADWP supports CARB's proposal to provide credits for ZEVs purchased before 2024 towards the 2024 purchase requirement, and requests that CARB specify this in the draft regulation language.

LADWP also recommends that CARB extend the early action credits for fleets that exceed the ZEV purchase requirement in the subsequent years (e.g. providing credit for ZEV purchases above 50% in 2024-2026). Another suggestion is to draw from other regulations or programs that have early action credit provisions and similarly allow a 1.2 or 1.5x credit for ZEVs purchased beyond the required amount towards future vehicle purchase requirements. These incentives would encourage fleet owners/operators to consider purchasing new ZEVs, facilitate ZEV adoption, and promote market development, while providing flexibility for other ZEVs that are not yet commercially available.

Reporting Deadline

The current proposal requires fleet owners/operators to submit an annual report by March 1 of each year. LADWP suggests moving the reporting deadline to April 1. LADWP, along with other reporting entities, are subject to important reporting deadlines that coincide with each other, such as South Coast Air Quality Management District's (SCAQMD) Air Emissions Reporting (AER), CARB's Mandatory Greenhouse Gas Reporting Regulation, and In-Use Off-Road Vehicle Regulation report (DOORS). Since most of these reporting deadlines occur in March, shifting the reporting deadline a month later would significantly alleviate resource constraints.

Conclusion

LADWP supports CARB's transition goals and looks forward to working with CARB to further refine the proposed language in ensuring a successful implementation of the ACF regulation. LADWP appreciates CARB's collaboration with the stakeholders and consideration of feedback provided. If you have any questions regarding these comments, please contact Ms. Andrea Villarin of my staff at (213) 367- 0409.

Sincerely,

Katherine Rubin

Digitally signed by Katherine Rubin
Date: 2021.10.28 18:48:40 -07'00'

Katherine Rubin
Manager of Air and Wastewater Quality and Compliance

EC:
c/enc: Mr. Tony Brasil, CARB
Mr. Craig Duehring, CARB
Mr. Paul Arneja, CARB
Ms. Andrea Villarin, LADWP

Appendix 1: Detailed Specialty Vehicle Descriptions

Over the years, LADWP has established a set of parameters for operating its specialty vehicles. These parameters, which vary among body types, include traveling a certain distance and being able to operate for a set number of hours before refueling, all while carrying specified weights. In addition, the vehicles need to operate near areas where fueling infrastructure is readily available. While LADWP remains hopeful that these parameters may be met with ZEVs, there aren't any commercially available options today. The following are a handful of examples to help illustrate why 100% ZEVs may not be a viable option for specialty vehicles, especially during emergency response situations. Like alternative-fueled specialty vehicles, ZEVs will likely require adequate infrastructure, longer chassis, and increased payloads, which could limit the vehicle's ability to operate in certain areas and situations. While LADWP continually seeks to purchase ZEVs and reduce emissions when possible, LADWP relies on its fleet of specialty vehicles to fulfill its obligation as a PEPS to reliably maintain water and power services.

Aerial Boom Trucks

Aerial boom trucks (Class 5, 7, & 8), as shown in Appendix 2 (Photograph 17), are operated by line crews when installing new poles and transformers, performing line construction, telecommunications cable maintenance and repair, and responding to service outages. Tree trimming crews also operate these vehicles to perform necessary routine maintenance around electrical lines. During an emergency response, any of these vehicles can be deployed to quickly replace overhead electric equipment and circuits.

A mixture of aerial boom trucks is needed to support different types of operations. Most line crews operate trucks with a 50 to 60 ft boom to work on 40 to 55 ft poles; however, some line crews operate larger trucks with 80 to 90 ft booms to work on taller 60 to 90 ft poles. LADWP has been replacing wood poles with steel poles due to their increased strength and longevity. Steel poles meet the increased strength requirements set by California Public Utilities Commission (CPUC) to harden electrical systems in California. In most cases, work on a steel pole requires a bucket truck due to regulations prohibiting working on high voltage while standing on a steel grounded structure. With these regulations in place, LADWP must have larger aerial boom trucks to not only maintain the distribution system, but also to repair the system during an emergency or natural disaster.

Tree trimming crews typically use trucks that have a 50-70 ft boom. The boom length of these trucks is determined by a tree database and the CPUC requirements to keep vegetation away from our high voltage lines, which are on 40 to 90-foot poles.

When responding to an emergency and restoring power to customers, crews are typically working a 16-hour shift. Requiring a crew to leave a job when the customer has no power to recharge a ZEV is not acceptable. ZEVs need to be equipped with tall enough booms and allow sufficient time to operate at job sites. Work conducted on taller poles often have power lines with higher voltages, which typically service larger customers such as hospitals, high-rise buildings, police stations, hotels, and others. Furthermore, vehicles located in the LA Basin could be required to assist in restoring power out of the basin or even out of state.

High Reach Aerial Platforms

High reach aerial platforms (Class 8), or Bronto Skylifts, as shown in Appendix 2 (Photographs 1-8, and 13-16), are a specialized type of aerial boom truck used by LADWP's maintenance crews to access overhead transmission line structures and components for construction, maintenance, inspection, and repairs throughout LADWP's service area. After thorough market research with multiple manufacturers, Bronto is currently the only manufacturer capable of meeting LADWP's operational needs. The performance capability, stabilizing system, work platform capacity, and safety features are unique to Bronto units. Operability and safety features include rear axles with full steering capability to maneuver these large off-road vehicles on diverse terrains, higher platform capacity, and dual-boom function for maneuverability and safety of the transmission crews. Alternative models lack sufficient torque and horsepower.

These units are crucial pieces of specialized equipment used in the increasing number of capital construction projects which include reconductoring, tower raising, and static line replacement - all of which are aimed to maintain the reliability of the transmission grid. These vehicles are used by LADWP's Overhead Transmission crews to maintain, inspect, and repair transmission lines that run from Los Angeles to other parts of California, Nevada, and Utah. These vehicles have booms of 150, 180, and 197 ft. During emergencies, these units are also used to restore power and provide mutual aid assistance where needed.

These units can be dispatched for months at a time to remote locations, making it challenging to deploy these vehicles in outlying areas that likely have limited charging infrastructure. For example, DWP maintains a base in Cedarville, California, which is at the Nevada, California, Oregon border. LADWP crews travel 162 miles from Fernley, Nevada to Cedarville via Route 447, which parallels our DC line and is the main access to the circuit. This does not account for the power required for the vehicle to operate at the job site. The situation is similar on Route 50 from Delta, Utah to Ely, Nevada, which crews travel on to maintain a 230KV transmission line.

Line Auger Boom Trucks

Line auger boom trucks (Class 8) are also used during the construction, maintenance, replacement, and repair of power poles, and power pole structures and components. They assist in maintaining the reliability of power distribution. These trucks tow pole and reel dolly trailers, which have axle ratings of 20,000 pounds. Alternative-fueled counterparts typically require a longer chassis, which makes it difficult to maneuver these trucks in tight areas, alleys, and narrow streets. As a result, low entry cab over chassis have been specified with a flatbed body to shorten the wheelbase and improve the curb-to-curb turning radius (28 ft, compared to the conventional cab, 38 ft). It is unknown at this time whether ZEVs would require longer chassis and pose similar challenges as alternative-fueled trucks. During an emergency response, line auger boom trucks are deployed to service outages and emergencies to restore power infrastructure, which may be located outside of the LA Basin. Many of the same operational limitations previously described for the aerial boom trucks also apply to these vehicles.

Hazmat Trucks

Hazmat trucks (Class 8) are equipped with a vacuum pump and are operated by LADWP's Field Hazmat crews to vacuum used or contaminated fluids such as engine and transmission oil,

coolants, hydraulic oil, and other fluids from holding tanks located on LADWP facilities. These fluids are transported from different mechanic shops to a centralized area for processing and safe disposal.

Hazmat trucks are deployed throughout LADWP's large service area. Hazmat trucks travel over 300 miles from Los Angeles to LADWP facilities as far as the Owens Valley and Boulder City, Nevada. In addition, these vehicles must be available 24/7 to respond to spill incidents and collect spilled fluids that could impact waterways, public property, and private property. These may include transformer oil, contaminated water, vehicle fluids, and other hazardous substances. Depending on the nature of the spill, these vehicles could continue operating on-site for up to 12 hours or more at a time. The vehicle engine and the power take-off will need adequate power to operate the vacuum pumps. Operations would be limited with ZEVs, whereas conventionally fueled trucks can be refueled at the job site via mobile fueling and operate continuously.

Due to the unpredictable nature of the operations, any of the trucks may be dispatched to various locations throughout the City at any time. All of LADWP's hazmat trucks are regularly used at the same time, and all require the same capabilities to respond immediately to time-sensitive situations that involve hazardous materials. While some activities are planned ahead of time, many times, the trucks are dispatched with very little notice.

Backhoe Trucks

Backhoe trucks (Class 8) are used during elevated response events to transport backhoes to restore essential services of water and power throughout LADWP's large service territory. These units typically transport heavy-duty backhoes weighing in the range of 25,000 to 30,000 pounds including accessories, such as different-sized buckets, and hydraulic hammers, to name a few. Vehicles are dispatched over 300 miles from Los Angeles to the Owens Valley to operate in the increasing number of infrastructure projects outside of Los Angeles. In addition, as part of mutual assistance agreements, these trucks may be called upon to provide disaster relief to other utilities and agencies across the nation to assist with restoring water and power.

Maintenance and Construction Trucks

Maintenance and construction trucks (Class 6 & 7) are used to transport crew, supplies, and tools from LADWP facilities to various job sites throughout Los Angeles for construction and maintenance work in the 7,000 miles that make up LADWP's vast water distribution system. These trucks need to be available on a 24/7 basis for emergency repair of water main breaks and water tanks. Crews travel to the job site with dewatering pumps and concrete breakers for use with the truck-mounted compressor. These tools are raised and lowered with the hydraulic tool lifter installed on the truck. The trucks are also equipped with a crane, pipe rack, acetylene tank holders, lightbars, and work-lights for night operation. The cranes are used for moving cover plates to cover trenches and dug areas, unloading hydrants, and other heavy supplies.

Truck Tractors, 3-Axle

Truck tractors, 3-axle (Class 8), as shown in Appendix 2 (Photographs 18-20, and 22), are used to transport equipment and materials to remote sites both within and outside of the LA Basin. These tractors require a minimum of 500 horsepower to haul loads of up to 160,000 pounds.

Appendix 2: Photographs of Specialty Vehicles

These photographs are a few examples intended to illustrate the types of operations and emergencies that LADWP's specialty vehicles respond to. They occur in a wide variety of terrains and very remote locations. Many situations require multiple vehicles working simultaneously to repair critical infrastructure. Additionally, vehicle usage patterns are unpredictable and they can be deployed at any time, sometimes in the middle of the night.

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

Photograph 10

Photograph 11

Photograph 12

Photograph 13

Photograph 14

Photograph 15

Photograph 16

Photograph 17

Photograph 18

Photograph 19

Photograph 20

Photograph 21

Photograph 22

Photograph 23

Photograph 24