AMES RESEARCH CENTER (ARC), CLIN 001

(a) Delivery Address
Ames Research Center
Receiving Section, Bldg N255
Moffett Field, CA  94035-1000

(b) Delivery Hours
(1)  Routine delivery hours:  7:30 a.m. to 3:00 p.m. (local time) Monday through Friday
(2)  Emergency delivery hours:  24 hours per day, 7 days per week

(c) Routine Requirements:
(1)  Liquid: 100 liters per month

(d) Peak Requirements:
(1)  Liquid: 400 liters per month (anticipated approximately twice per year). Weekly deliveries of 100 liters per week anticipated during peak months, with the highest projected weekly order of 200 liters.

(e) Special Delivery Equipment Requirements:  Contractor to provide all dewars (100 liter dewars).

(f) Special Delivery Conditions:  The contractor shall deliver within 48 hours of receiving a request for shipment. Requests for shipment called in by 11:00 a.m. (local time) shall be delivered by 11:00 a.m. (local time) of the second working day following the request for shipment. Requests for shipment called in after 11:00 a.m. (local time) shall be delivered by 11:00 a.m. (local time) of the third working day after.

(g) Government furnished equipment:  None.

(h) Special Access Requirements (i.e., security):  Delivery Vehicles may be subject to search prior to entry at ARC. All drivers required to be U.S. citizens. The contractor is required to show delivery paperwork to access the Center.

(i) Geographic Location:  ARC is located on the border of the cities of Mountain View and Sunnyvale in northern California, at the southern end of San Francisco Bay. ARC occupies about 430 acres of land, and serves as host to a number of other Federal, Civilian, and Military resident agencies on the adjoining 1,500-acre former Naval Air Station, now known as Moffett Federal Airfield.

(j) Delivery Driver Directions:  From Highway 101, exit onto Moffett Boulevard. Proceed toward ARC Main Gate. After showing delivery paperwork to gate guard, obtain directions from guard to Bldg N255, Receiving Section (at the corner of De France and Allen Road). Directions from gate guard required because of changing routes on ARC due to ongoing road construction.

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

ARMSTRONG FLIGHT RESEARCH CENTER (AFRC), PALMDALE CA (LA-PALMDALE REGIONAL AIRPORT OPERATIONS), CLIN 002

(a) Delivery Address
LA-Palmdale Regional Airport
2825 East Avenue P, Bldg 703
Palmdale, CA 93550

(b) Delivery Hours
(1) Routine delivery hours: 8:00 a.m. - 3:00 p.m. (local time) Monday through Friday.
(2) Emergency delivery hours: 24 hours per day, 7 days per week

(c) Routine Requirements: 2800 liters of dewar liquid per month. Weekly delivery amounts of 700 liters anticipated. Routine Requirements increase to 3800 liters per month and 1700 liters per week up to six times a year during months/weeks with deliveries of four 250 liter dewars (See Special Delivery Conditions“)

(d) Peak Requirements: 4600 liters of Dewar liquid per month, anticipated 2 times per year. Maximum anticipated weekly delivery amount of 2000 liters.

(e) Special Delivery Equipment Requirements: Contractor must supply all dewars. 100 liter dewars will be required for the majority of requirements with periodic 250 liter dewars required for specific servicing requirements (see “Special Delivery Conditions“). A lift-gate on the rear of the delivery truck is necessary for on/off-loading Dewars.

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. Driver should enter the parking lot immediately in front of Building 703 and report to the Security bungalow in front. The guard will issue a temporary visitor badge and call the delivery POC inside for escort.

(g) Government-Furnished Equipment: None

(h) Special Delivery Conditions
(1) LHe deliveries in support of Stratospheric Observatory for Infrared Astronomy (SOFIA) operations. Flight operations anticipated 9 to 10 months a year with maintenance periods 2 to 3 times each year (each maintenance period lasting approximately one month). There is the potential to change to one 2-month maintenance period verses multiple 1-month maintenance periods during a year. Majority of LHe dewar requirements will occur during months of flight operations (see “Routine” and “Peak” requirements for quantities) with reduced usage during maintenance periods (currently anticipated at approximately 100 liters per week). First flight operations anticipated to begin in November 2019.

(2) Deliveries anticipated 1-2 times a week, with deliveries two times a week anticipated routinely during flight operation months. Reduced delivery quantity anticipated during maintenance periods. Deliveries on Tues/Thurs or Tues/Fri desired for twice weekly deliveries.

(3) Deliveries of 1000 liters (in a single delivery) in 250 liter dewars anticipated four to six times a year to support specific instrument servicing during flight operations. Remaining requirements will require 100 liter dewars. If less than 1000 liters in 250 liter dewars is required in a single delivery, 250 liter and 100 liter dewars may be ordered together and for receipt in the same shipment/delivery. If more than 1000 liters total is required in a week, there would be a minimum of two deliveries (on different days) during that week.
(4) Potential requirement for deliveries on Monday in addition to regular twice-weekly deliveries during high usage periods.

(5) Normal deliveries within 48 hours of receiving a request for shipment. Potential for emergency delivery with 24-hour notice if operations require. The “emergency delivery charge” will apply for these 24 hour deliveries.

(6) Driver should enter the parking lot immediately in front of Building 703 and report to the Security bungalow in front. The guard will issue a temporary visitor badge and call the delivery POC inside. The delivery POC will come outside, open the vehicle gate, and direct the driver to the two cryogen storage sheds inside the fenced area for off-loading. A lift-gate on the rear of the delivery truck is necessary for on/off-loading Dewars.

(i) Geographic Location: Located at the LA Palmdale Regional Airport in Palmdale CA

(j) Delivery Driver Directions: From Highway CA-14 North (Antelope Valley Freeway) in Palmdale, CA, take exit #37 (Rancho Vista Boulevard) and travel east on Rancho Vista Boulevard (also called Avenue P for portions of the same road) approximately 3.5 miles to 30th Street East. Turn left at stop sign and follow the road into the complex. Signs will direct drivers to NASA delivery location (Note: driver is NOT to follow the signs for fuel deliveries). The NASA hangar (Building 703) is the larger of the two hangars and is marked with the NASA logo. Driver should enter the parking lot immediately in front of Building 703 and report to the Security bungalow in front. The guard will issue a temporary visitor badge and call the delivery POC inside. The POC will come outside and open the vehicle gate, and direct the driver to the two cryogen storage sheds inside the fenced area for off-loading.

(End of text)
COLUMBIA SCIENTIFICA BALLOON FACILITY (CSBF), PORT HUENEME CA (ANTARCTIC SUPPORT), CLIN 007

(a) Delivery hours:
   (1) Routine delivery hours: 7:30 am - 4:00 pm (local time) Monday through Friday.
   (2) Emergency delivery hours: Not applicable.

(b) Delivery address and contact:
   (1) GHe (ISO containers)
      (i) Address: Bldg 471 North End NBVC, Port Hueneme CA 93043
      (ii) Contact: Jackie Samuel (805-985-6851)

(c) Geographic locations: The Port of Hueneme is located in Port Hueneme CA, between Los Angeles and Santa Barbara, approximately 65 miles northwest of Los Angeles CA.

(d) Routine requirements:
   (1) Bulk Gas: 640,000 per shipment to occur once per year

(e) Peak requirements:
   (1) Bulk Gas: 800,000 per shipment to occur once per year. Estimated to occur no more than twice per contract, currently anticipated in contract years 2 and 4

(f) Special delivery equipment requirements:
   (1) ISO containers are required due to the unique transportation and operational requirements in Antarctica. Bulk gaseous helium trailers are NOT acceptable.
      (i) ISO-Containers will be approximately 40’Lx8’Wx8’H. The ISO Containers must be capable of being lifted by a crane and standard rigging. ISO Containers of 9 to 13 tubes are acceptable with a lesser number of larger capacity tubes preferred if available. Smaller containers (i.e., 20’ ISO containers) which together provide an equivalent amount of gas of the larger required ISO Containers are not acceptable due to limitations of equipment and hardware required to transport the containers during launch operations.
      (ii) Total water volume of each ISO-container will be approximately 880scf.
      (iii) Each container will contain a minimum capacity of 140,000 cubic feet of helium.
      (iv) Minimum fill pressure will be 2,640 psig at 70 degrees F.
      (v) Minimum discharge rate to atmosphere will be 150,000 scf per hour (as long as module pressure is above 1,500 psig).
      (vi) ISO-Container plumbing specifications:
         (A) ISO-Containers will be equipped with two outlets and valves terminating with a ¾ inch NPT male pipe thread or terminate with two male CGA 1540 fittings. These outlets will be capped off with a ¾ inch female cap. Outlet valves to have a flow coefficient (Cv) of 3.1 or higher.
         (B) Header will be equipped with one outlet for gauging pressure, terminating a CGA 580 female fitting.
         (C) Working pressure for all headers, outlet piping, and fittings will be 3,000 psi (for 2800 psi fill pressure) or greater.
(D) ISO-Container plumbing will not have check valves or other components that restrict gas flow or impede ISO-Container recharging (by CSBF personnel if required).

(E) All valves will be pressure and leak tested. All valves will be tested prior to fill to assure seats are in good working order.

(F) A tube diagram will be provided to CSBF prior to shipment (normally during pre-shipment coordination). A report on the pressure in each ISO-Container tube will be supplied to CSBF prior to shipment. The water volumes of each ISO-Container tube will be provided to CSBF prior to shipment.

(2) If the Contractor is required to lease ISO containers specifically to support this location, the rental charges will be for the entire term of the contract (base period plus any exercised options) as identified in the Schedule. If an ISO container is retained by the location past the end of the contract period (awaiting shipment back to Port Hueneme), the rental rate will be calculated with a yearly rate increase of the same percentage as for the last year of the contract. If a tube is required to be removed from an ISO container to comply with DOT weight restrictions, the cost to perform this operation will be charged as designated in the Schedule. The removed tube will not be required to be reinstalled on the ISO container for the remainder of the contract. This fee will be assessed on an as needed basis and should include the effort to reinstall the tube at the conclusion of the contract.

(g) Special access requirements: Drivers required to be U.S. Citizens

(h) Government furnished equipment: None.

(i) Special delivery conditions:

(1) A shipment of gaseous helium in ISO containers to Antarctica is required annually to support NASA's Long Duration Balloon Program. The amount of helium required is estimated to vary between 640,000 and 800,000 standard cubic feet (4 to 5 ISO containers at 160,000 scf each) depending on the planned flight program and other factors such as balloon launch aborts and unexpected loss of gas while containers are stored in Antarctica. See “Special Delivery Equipment Requirements” for ISO container requirements. The shipments are sent via ocean transit using a ship commissioned by the National Science Foundation (NSF). There is only one ship per year. All ocean shipments originate from the Port of Hueneme, located at Port Hueneme California. Depending on loading schedule, the trailers the ISO containers are delivered on to Port Hueneme may be offloaded upon delivery or retained for up to 3 weeks. The vessel departs in early December, arrives at McMurdo Station in mid-January, and returns to Port Hueneme in March. This round trip ocean transit occurs only once per year. Helium ISO containers must be delivered to the Port of Hueneme no later than mid-November each year. CSBF typically initiates a purchase order for the desired number of ISO-Containers no later than August of each year to allow for adequate coordination prior to shipment. In a nominal year, CSBF typically orders 4-5 ISO-Containers (640,000-800,000 scf gaseous helium). The first yearly shipment under the contract is anticipated to require a “Routine” requirement of 640,000 scf of gaseous helium (4 ISO Containers).

(2) NASA/CSBF launches balloons from McMurdo Station starting in December. The helium shipped via sea from Port Hueneme in December is intended for use one year later. At the conclusion of the launch period (approximately the end of December or in January) any empty containers are delivered to the port at McMurdo Station for return shipment to Port Hueneme. An ISO container shipped in December from Port Hueneme will not be returned to
the United States for approximately 15 months. Based on current operational plans, CSBF typically requires 7 ISO-Containers on site in Antarctica during the October-December period. Therefore, due to shipping logistics, the contractor may be required to have as many as 12 ISO-Containers dedicated for NASA use: 5 in shipment (between December and March) and 7 on site in McMurdo Station, Antarctica supporting the launches.

(End of text)
(a) Delivery Address:
Columbia Scientific Balloon Facility
1510 FM RD 3224
Palestine, TX  75802

(b) Delivery Hours
(1) Routine delivery hours: 7:30 am - 4:30 pm (local time) Monday through Friday
(2) Emergency delivery hours: 24 Hours a day, 7 days a week

(c) Routine Requirements:
(1) Bulk gas: 450,000 scf per month to occur 2 times per year. Note: Bulk gas trailers are typically requested in the April time frame and are utilized through the end of August to support balloon launches.
(2) Dewar liquid: 15,000 liters per month, to occur 2 times per year. 500 liter dewars. Dewars are normally required for delivery in May and June each year and typically requested in the April timeframe each year.

(d) Peak Requirements:
(1) Bulk gas: 600,000 scf per month may occur up to 2 times per year (dependent on future changes on flight operations schedule). Peak requirement event would be instead of Routine Requirement event. Note: Bulk gas trailers are typically requested in the April time frame and are utilized through the end of August to support balloon launches. Largest anticipated weekly requirement of 300,000 scf.
(2) Dewar liquid: 20,000 liters per month to occur up to 2 times per year. Peak requirement event would be instead of Routine Requirement event. 500 liter dewars. Dewars are normally required for delivery in May and June each year and typically requested in the April timeframe each year.

(e) Special Delivery Equipment Requirements:
(1) Preference is for bulk gas trailers with ten (10) to thirteen (13) tubes. The tubes will be rated at 2,800 psig or greater and containing at least 160,000 scf with a minimum discharge rate to atmosphere of 150,000 cubic feet per hour (as long as module pressure is above 1,500 psig). The bulk gas trailers are dropped at site and returned when empty or at the end of the project. Trailers will be equipped with a header connecting all tubes together. Each tube will have a cutoff valve with handle. The header will be equipped with two discharge connections. Each discharge connection will include a Western Valve 1800E or Superior 430C Master Shut Off Valve with a minimum flow coefficient (Cv) of 3.05 or greater. Both discharge connections will terminate with a CGA 1540 connection. The header will be equipped with one outlet for gauging pressure, terminating in a CGA 580 female fitting. Working pressure for all headers, outlet piping, and fittings will be 3,000 lbs or greater. The trailers plumbing will have no check valves or other components that restrict gas flow or impede recharging by CSBF (if required). All valves will be pressure and leak tested prior to fill to assure seats are in good working order. Each trailer will be placarded with current information on the water volume of the trailer, and CSBF will be furnished with a report showing the pressure in each tube. In the
absence of this plate/placard information, the information will be available from the contractor upon request.

(2) Bulk gas trailer rental to be determined on a per day basis. If a trailer is retained by the location past the end of the contract period, the rental rate will be calculated with a yearly rate increase of the same percentage as for the last year of the contract.

(3) 500 liter dewars are anticipated to be provided by CSBF (see “Government Furnished Equipment”). Contractor to provide occasional 100 liter dewar.

(4) Deliveries of bulk gas trailers and dewars within 48 hours after order is placed.

(f) Special Access Requirements: Drivers required to be U.S. Citizens

(g) Government-Furnished Equipment: (Note: Equipment shown below will be utilized at both the Palestine TX and Ft Sumner NM CSBF locations):

   500 liter dewars: 22

(h) Geographic Location: Palestine is located in east Texas between Dallas and Houston. Approximately 100 miles southeast of Dallas, TX.

(i) Delivery driver directions: From Dallas, take I-45 to Corsicana exit., follow U.S. 287 to FM 3224, turn right, approximately 1.5 miles on left

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

COLUMBIA SCIENTIFIC BALLOON FACILITY (CSBF), FT. SUMNER, NM, CLIN 005/006

(a) Delivery Address
   Columbia Scientific Balloon Facility
   Ft. Sumner, NM

(b) Delivery Hours
   (1) Routine delivery hours: 7:30 am to 4:30 pm (local time)
   (2) Emergency delivery hours: 24 hours a day, 7 days a week

(c) Routine Requirements:
   (1) Bulk gas: 930,000 scf per month to occur 2 times per year, normally once in July and once in August. Note: Bulk gas trailers are typically requested in the June time frame and are utilized through the end of October to support balloon launches.
   (2) Dewar liquid: 15,000 liters per month in 500 liters to occur 2 times per year, normally in July and August. Typically orders placed in the June timeframe.

(d) Peak Requirements:
   (1) Bulk gas: 1,600,000 scf per month to occur up to 2 times per year. Peak requirement event would be instead of Routine Requirement event. Increase from routine requirement due to potential support of additional operations in September each year (note: may occur as early as mid-August and as late as mid-October). Maximum weekly delivery amount of 930,000 scf, which could occur during the peak operations period anticipated in September (note: may occur as early as mid-August and as late as mid-October).
   (2) Dewar liquid: 20,000 liters per month, to occur up to 2 time per year. Increase from routine requirement due to potential support of additional operations. Peak requirement event would be instead of Routine Requirement event. Most of requirement to utilize 500 liter dewars, with an occasional 100 liter dewar required.

(e) Special Delivery Equipment Requirements
   (1) Preference is for bulk gas trailers with ten (10) to thirteen (13) tubes. The tubes will be rated at 2,800 psig or greater and containing at least 160,000 scf with a minimum discharge rate to atmosphere of 150,000 cubic feet per hour (as long as module pressure is above 1,500 psig). The bulk gas trailers are dropped at site and returned when empty or at the end of the project. Trailers will be equipped with a header connecting all tubes together. Each tube will have a cutoff valve with handle. The header will be equipped with two discharge connections. Each discharge connection will include a Western Valve 1800E or Superior 430C Master Shut Off Valve with a minimum flow coefficient (Cv) of 3.05 or greater. Both discharge connections will terminate with a CGA 1540 connection. The header will be equipped with one outlet for gauging pressure, terminating in a CGA 580 female fitting. Working pressure for all headers, outlet piping, and fittings will be 3,000 lbs or greater. The trailers plumbing will have no check valves or other components that restrict gas flow or impede recharging by CSBF (if required). All valves will be pressure and leak tested prior to fill to assure seats are in good working order. Each trailer will be placarded with current information on the water volume of the trailer, and CSBF will be furnished with a report showing the pressure in each tube. In the
ATTACHMENT 1 – STATEMENTS OF WORK

absence of this plate/placard information, the information will be available from the contractor upon request.

(2) Bulk gas trailer rental to be determined on a per day basis. If a trailer is retained by the location past the end of the contract period, the rental rate will be calculated with a yearly rate increase of the same percentage as for the last year of the contract.

(3) Normal order notification for deliveries to Ft Sumner New Mexico is two (2) weeks. Occasional order notification of one (1) week may be required for deliveries to Ft Sumner New Mexico with prior coordination and agreement with supplier.

(4) 500 liter dewars are anticipated to be provided by CSBF (see “Government Furnished Equipment”). Contractor to provide occasional 100 liter dewar

(f) Special Access Requirements: Drivers required to be U.S. Citizens

(g) Government-Furnished Equipment: (Note: Equipment shown below will be utilized at both the Palestine TX and Ft Sumner NM CSBF locations)

500 liter dewars: 22

(h) Special Delivery Conditions: Operational requirements may require up to six trailers on site at once if replenishments (two trailers at a time) cannot be accomplished within a 48 hour turnaround time. Acceptable alternative is for four trailers on site initially with capability to replenish two trailers at a time within 48 hours.

(i) Geographic Location: Ft. Sumner is located in east central New Mexico, approximately 60 miles west of Clovis, NM.

(j) Delivery Driver Directions: Delivery site is located at the Ft. Sumner Municipal Airport.

(End of text)
GLENN RESEARCH CENTER (GRC), CLIN 008

(a) Delivery Address
Glenn Research Center
21000 Brookpark Rd
Cleveland, OH 44135

(b) Delivery Hours
(1) Routine delivery hours: 8:00 a.m.- 4:00 p.m. (local time) Monday through Friday
(2) Emergency delivery hours: 24 hours per day, 7 days per week.

(c) Routine Requirements: 80,000 scf bulk gas per month, estimated up to four times a year.

(d) Peak Requirements:
   (i) 180,000 scf bulk gas per month, estimated once per year.
   (ii) Note: Peak requirement month may be in addition to Routine requirement months.

(e) Special Delivery Equipment Requirements: N/A

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. The contractor is required to obtain badges for delivery personnel for access to the Center. The contractor shall ensure that these badges remain current.

(g) Government-Furnished Equipment: Tube trailers will be used in execution of the option of the Government for the drop off/pick up of Government trailers at the transfill (see Special Delivery Conditions). Listed equipment is utilized at both the GRC Cleveland site as well as the Plumbrook site:

<table>
<thead>
<tr>
<th>Trailer ID</th>
<th>MAWP (psi)</th>
<th>Oper. Pressure (psi)</th>
<th>Capacity (scf) @ 2400 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT-04</td>
<td>2400</td>
<td>2100</td>
<td>75,050</td>
</tr>
<tr>
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</tr>
<tr>
<td>TT-29</td>
<td>2400</td>
<td>2100</td>
<td>79,766</td>
</tr>
<tr>
<td>TT-54</td>
<td>2500</td>
<td>2400</td>
<td>55,872</td>
</tr>
</tbody>
</table>

The Government reserves the right to add/discontinue GFE trailers from the list of available GFE.

(h) Special Delivery Conditions
(1) Contractor shall transport product in vendor owned trailers (up to 180,000 scf capacity if requested by the Government) to fill on site storage (including Govt tube trailers) of gaseous helium at the Government location, or fill Government owned gaseous helium trailers that are delivered by the Government to the contractors fill location. Contractor deliveries to location utilizing contractor owned trailers normally within 72 hours of ordering. In emergency situations, requests may be made within less than 72 hours and subject to Emergency Delivery charge if accepted by supplier.
(2) For filling of GHe storage at GRC: Typical pressure at the time of fill is 300 psig. Maximum allowable pressure of receiver vessel at the end of delivery is 2400-2600 psig.

(i) Delivery in vendor owned trailers may be required within 24 hours upon receipt of order, Monday through Thursday. The “short notice emergency delivery charge” will apply for these 24 hour deliveries.

(ii) For orders placed on Friday, a Monday delivery in vendor owned trailers is required. The “short notice emergency delivery charge” will not apply.

(3) The Government may transport and drop off empty Government owned trailers to the contractor’s facility upon notification and acceptance of the Government’s requirement by the contractor. The contractor will be given a 2-day notice by the Government prior to the Government’s delivery of the Government-owned gaseous trailers to the transfill station. The “short notice emergency delivery charge” will not apply due to over 24 hour notice. The contractor shall fill trailers within 24 hours of drop off. The Government will pick up the Government-owned trailers and transport them to the delivery point. Exercising the option to drop off/pick up Government trailers at the transfill will be solely up to the Government at the time the product is ordered. A 40 mile one way distance from GRC (Cleveland) to the transfill will be considered the maximum reasonable distance for the Government to exercise this option of the drop off/pick up Government trailers at the transfill.

(i) Geographic Location: GRC is located at 21000 Brookpark Road, approximately 20 miles southwest of the city of Cleveland. Situated on 350 acres of land adjacent to Cleveland Hopkins International Airport, GRC comprises more than 140 buildings that include 24 major facilities and over 500 specialized research and test facilities.

(j) Delivery Driver Directions: From I-480 West, exit at Grayton Ave. Head south on Grayton Road. Turn right (west) onto Brookpark Road for ½ mile to main gate of GRC

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

GLENN RESEARCH CENTER, PLUM BROOK STATION (GRC-PB), SANDUSKY OH, CLIN 009

(a) Delivery Address
(b) GRC Plum Brook Station
   3597 Scheid Rd
   Sandusky, OH  44870
(c) Delivery Hours
   (1) Routine delivery hours:  7:30 a.m.- 3:30 p.m. (local time) Monday through Friday
   (2) Emergency delivery hours:  24 hours per day, 7 days per week
(d) Routine Requirements:
   (1) Bulk Gas
      (i) Test 1 (see Special Delivery Conditions): 420,000 scf per month.  280,000 scf per week
      (ii) Test 2 (see Special Delivery Conditions):  1,400,000 scf per month. 450,000 scf per week
      (iii) Test 3 (see Special Delivery Conditions):  1,820,000 scf per month. 550,000 scf per week
(e) Peak Requirements:
   (1) Bulk Gas
      (i) Test 1 (see Special Delivery Conditions): 600,000 scf per month.  400,000 scf per week
      (ii) Test 2 (see Special Delivery Conditions): 2,100,000 scf per month. 600,000 scf per week
      (iii) Test 3 (see Special Delivery Conditions):  2,520,000 scf per month.  800,000 scf per week
(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. The contractor
   is required to obtain badges for delivery personnel for access to the Center. The contractor shall
   ensure that these badges remain current.
(g) Government-Furnished Equipment: Tube trailers will be used in execution of the option of the
   Government for the drop off/pick up of Government trailers at the transfill (see Special Delivery
   Conditions). Listed equipment is utilized at both the GRC Cleveland site as well as the Plum Brook
   site:

<table>
<thead>
<tr>
<th>Trailer ID</th>
<th>MAWP (psi)</th>
<th>Oper. Pressure (psi)</th>
<th>Capacity (scf) @ 2400 psi</th>
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<td>TT-54</td>
<td>2500</td>
<td>2400</td>
<td>55,872</td>
</tr>
</tbody>
</table>

The Government reserves the right to add/discontinue GFE trailers from the list of available GFE.

(h) Special Delivery Conditions
(1) Deliveries of standard pressure (2400 psi-3000 psi) helium in support of testing at GRC-PB during contact period. Three different tests are anticipated:

(i) Test 1: Anticipated once in Contract Year 1, and once in Contract Year 3. Note that the test in Contract Year 1 may be moved to Contract Year 2. Estimate of 420,000 scf total helium required for each Test 1 over a period of approximately 1-2 months. Routine requirement reflect 1 month test. Peak requirements reflect larger estimated total in case additional GHe required for test.

(ii) Test 2: Anticipated in Contract Year 2 but potential to be moved into Contract Year 1. Total helium requirement 3,500,000 scf over 3 months.

(iii) Test 3: Anticipated once in Contract Year 4 or Year 5. Total helium requirement of 4,340,000 scf over two months.

(2) GHe delivery information

(i) Contractor shall transport product in vendor owned trailers (up to 180,000 scf capacity if requested by the Government). Most vendor owned trailer deliveries will be utilized directly for testing with the potential to occasionally fill gas receiver vessels or government owned trailers at the Government location. During test periods, 24/7 delivery support of vendor owned trailers may be required, including weekends. Contractor deliveries to location utilizing contractor owned trailers within 72 hours of ordering, although in emergency situations requests may be made within less than 72 hours and subject to Emergency Delivery charge if accepted by supplier.

(ii) Typical pressure of receiver vessel at the time of fill is 300 psig. Maximum allowable pressure of receiver vessels at the end of delivery will vary based on individual receiver maximum allowable working pressures, ranging from 1380 to 5500 psig. Maximum pressure of government-owned trailers is 2400-2600 psig.

(iii) On site compressor (operated by the government) will be available to fill receiver vessels, including vessels whose maximum allowable working pressures exceed the supplier’s maximum standard trailer pressures (approx. 2400-3000 psi).

(iv) In addition to delivery of vendor owned trailers to location, the Government may transport and drop off empty Government owned trailers to the contractor’s facility upon notification and acceptance of the Government’s requirement by the contractor. The contractor will be given a 2-day notice by the Government prior to the Government’s delivery of the Government-owned gaseous trailers to the transfill station. The contractor shall fill trailers within 24 hours of drop off. The Government will pick up the Government-owned trailers and transport them to the delivery point. Exercising the option to drop off/pick up Government trailers at the transfill will be solely up to the Government at the time the product is ordered. A 40 mile one way distance from GRC (Cleveland) to the transfill will be considered the maximum reasonable distance for the Government to exercise this option of the drop off/pick up Government trailers at the transfill.

(3) The Government may request the delivery and detention of vendor owned trailers (up to 180,000 scf capacity) at GRC-Plum Brook when GFE trailer assets are inadequate to support GRC-Plum Brook requirements. This is anticipated during the multiple testing periods mentioned above. A minimum of 45 days lead time to the vendor will be provided to coordinate and facilitate delivery of vendor owned trailers to be detained at GRC-Plum Brook.
ATTACHMENT 1 – STATEMENTS OF WORK

Detention of up to 4 vendor supplied trailers at a time can be anticipated to take place for the duration of each test period (from 1 to 3 months depending on the test) and may occur up to twice a year.

(i) Geographic Location: GRC-Plum Brook Station, (6400-acres) is located about 10 miles south of downtown Sandusky, Ohio and approximately 60 miles west of downtown Cleveland.

(j) Delivery Driver Directions: The Plum Brook Main Gate is located on Scheid Road off of U.S. 250, approximately 3 miles north of I-80 (Ohio Turnpike) exit 118.

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

GODDARD SPACE FLIGHT CENTER (GSFC), CLIN 010/011/012/013/014/015

(a) Delivery Address
Goddard Space Flight Center
Mail Code 279.0
Greenbelt, MD 20771

(b) Delivery Hours
(1) Routine delivery hours: 7:30 a.m.- 3:00 p.m. (local time) Monday through Friday
(2) Emergency delivery hours: 24 hours per day, 7 days per week.

(c) Routine Requirements:
(1) GHe (Grade B cylinders): 8,500 scf per month
(2) LHe: 3,000 liters per month

(d) Peak Requirements:
(1) GHe (Grade B cylinders): 18,000 scf per month (anticipated 2 times a year)
(2) LHe: 9,000 liters per month (anticipated 2 times a year)

(e) Special Delivery Equipment Requirements:
(1) GHe: See “Government-Furnished Equipment’ for Grade B cylinder GFE info. Contractor is required to pick-up all cylinders from Building 87, at GSFC, Greenbelt, MD., refill, and return the cylinders back to Building 87. Building 87 is a cryogenic storage facility that is unoccupied. Cylinder pickup is usually between 7:30 a.m. and 3:00 p.m. (local time). If the contractor requires a different time for pickup, the driver will have to call before each shipment to arrange for pick-up/delivery times. The contractor is required to contact a GSFC cryogenics representative during every pick-up and delivery.
(2) LHe: Contractor must supply all dewars. Normal dewar size will be 100 liters, but occasionally 60 liter, 250 liter, 350 liter and 500 liter dewars will be used. Dewars must be super insulated and must have a 3/8 inch withdrawal connection.

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. The contractor is required to obtain GSFC badges for a minimum of 2 contractor delivery personnel for access to the Center. The contractor shall ensure that these badges remain current.

(g) Government-Furnished Equipment: There are a total of 75 gaseous helium cylinders available for the Grade B cylinder requirement only. Government-owned cylinder size is 213 scf and has a CGA 580 valve. The Contractor must supply all dewars and UHP cylinders.

(h) Special Delivery Conditions
(1) GHe:
   (i) Gas cylinder delivery location: Goddard Space Flight Center, Mail Code 279.0, Building 87, Greenbelt, MD 20771
   (ii) Turnaround time for cylinders is no later than 2 weeks from date of cylinder pick-up. The driver must check in with Carla Jackson, (301) 286-1459 for delivery instructions. Contractors are required to inspect cylinders for hydrostatic testing, painting and replacement of valves, as needed. All charges for cylinder testing, repairs, etc. will be per contract maintenance schedule. Periodic coordination between location and
contactor will be used to monitor requirement for cylinder pickups and deliveries. Upon cylinder pickup, the contractor shall annotate the quantity of cylinders on the contractor pickup form and provide a copy to GSFC (Carla Jackson or her authorized representative) for their records before leaving GSFC.

(2) LHe:
   (i) Dewar liquid delivery location: Goddard Space Flight Center, Mail Code 279.0, Building 7, Greenbelt, MD 20771
   (ii) Contractor is required to pick-up and deliver dewars twice per week, normally on Tuesdays and Thursdays. The driver must check in with Carla Jackson, (301) 286-1459 for delivery instructions.
   (iii) Upon completion of deliveries the driver must annotate the dewar quantity delivered (in liters), serial number, and sign the delivery ticket. The driver will also annotate on the delivery ticket the serial numbers of any empty dewars picked up. The driver shall provide 1 copy of all paperwork to Carla Jackson (or her authorized representative) before leaving GSFC.
   (iv) Delivery of dewars to be within 72 hours after order is placed. Normal GSFC Dewar deliveries to be on Tuesdays and Thursdays unless otherwise coordinated with the location. Orders for Tuesday deliveries will be placed the previous Friday.
   (v) When an empty dewar is ready for pickup, the location POC will contact the contractor by phone. The rental charges charges for the empty dewar will end on the day the contractor is notified by the location POC. The location POC will document the phone call with an e-mail to the contractor.

   (i) Geographic Location: GSFC is located in Maryland, northeast of Washington, DC.
   (j) Delivery Driver Directions
      (1) From Washington, DC: Take the Capital Beltway (I95/I495) to Exit 22A Greenbelt Road (Rt 193). Go east on Greenbelt Road for approximately 2 miles. The GSFC main entrance will be on the left. Go past the main entrance to the second traffic light at Good Luck Road. Make a left turn followed by another left turn at sign marked “GSFC Central Receiving, All Deliveries”. Drivers will be given a pass to enter the facility.
      (2) From Baltimore: Take 95 South to I495 East. From I495 take Exit 22A Greenbelt Road (Rt 193). Go east on Greenbelt Road for approximately 2 miles. The GSFC main entrance will be on the left. Go past the main entrance to the second traffic light at Good Luck Road. Make a left turn followed by another left turn at sign marked “GSFC Central Receiving, All Deliveries”. Drivers will be given a pass to enter the facility.

(End of text)
(a) Delivery Address
GSFC Wallops Flight Facility
Building B-30
Wallops Island, VA  23337

(b) Delivery Hours
   (1) Routine delivery hours:  8:00 a.m. - 3:30 p.m.(local time) Monday through Friday
   (2) Emergency delivery hours:  N/A

(c) Routine Requirements:  1500 scf per month, approximately 3 times per year

(d) Peak Requirements:  4300 scf per month, approximately 2 times per year. These peak requirements
   are anticipated to occur in addition to the Routine requirements listed.

(e) Special Delivery Equipment Requirements:  Delivery truck needs to have a lift gate so that cylinders
   can be rolled upright from truck to cylinder locker.

(f) Government-Furnished Equipment: A total of 20 Government-owned helium cylinders are available
   for use at this location.  Cylinder size is 213 scf.

(g) Special Delivery Conditions:  Delivery shall be within seven days after order is placed.  Turnaround
   time for cylinders is no later than one week from date of cylinder pick-up. Contractor is required to
   inspect cylinders for hydrostatic testing, painting and replacement of valves, as needed. All charges
   for cylinder testing, repairs, etc. will be per contract maintenance schedule. Periodic coordination
   between location and contractor will monitor requirement for cylinder pickups and deliveries.
   Upon cylinder pickup, the contractor shall annotate the quantity of cylinders on the contractor
   pickup form and provide a copy to GSFC WFF for their records.

(h) Special Access Requirements (i.e., security):  All drivers required to be U.S. citizens. The contractor
   is required to obtain badges for delivery personnel for access to the Center. The contractor shall
   ensure that these badges remain current.

(i) Geographic Location:  WFF is located Approximately 45 miles south of Salisbury, Maryland on the
   Delmarva Peninsula.

(j) Delivery Driver Directions
   (1) Deliveries shall be made direct to NASA, GSFC WFF. Proceed from Salisbury, MD, south on
       Route 13 for approximately 40 miles. At Oak Hall, VA, proceed left onto Route 175 East.
       Follow signs to WFF (approximately 5 miles off route 13). After proceeding from Main Gate
       Entrance, take first left onto Wormhoudt Street. Stop at the loading dock of the third building
       on your right (Building F-19 Receiving). Receiving personnel will then have you follow them to
       Building B-30 (Hazmat Warehouse) which is less than 1 mile from the Building F-19 loading
dock.

   (2) From the Norfolk, VA area proceed north on Northampton Blvd.(Route 13) across the
       Chesapeake Bay Bridge and Tunnel System to Oak Hall, VA (approximately 80 miles). At Oak
       Hall, VA, take a right onto route 175 East. Follow signs to WFF (approximately 5 miles off
       route 13). After proceeding from Main Gate Entrance, take first left onto Wormhoudt Street.
       Stop at the loading dock of the third building on your right (Building F-19 Receiving).
       Receiving personnel will then have you follow them to Building B-30 (Hazmat Warehouse)
       which is less than 1 mile from the Building F-19 loading dock.  (End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

JET PROPULSION LABORATORY (JPL), CLIN 017/018

(a) Delivery Address
Jet Propulsion Laboratory
Building 338-100
Mail Code 338-100
4800 Oak Grove Drive
Pasadena, CA 91109

(b) Delivery Hours
(1) Routine delivery hours: 8:00 a.m.- 3:00 p.m.(local time) Monday through Thursday
(2) See “Special Delivery Conditions” for additional JPL specific info

(c) Routine Requirements
(1) Dewar liquid: 1,660 liters per month
(2) Bulk Gas: Delivery of a vendor GHe trailer is anticipated to occur once over the entire contract period (may occur as early as contract year 1 (FY20), but could occur on any other year of the contract). Estimated quantity of requirement is 40,000 scf at 2250 psig min.

(d) Peak Requirements: 3,000 liters of Dewar liquid per month, anticipated once per year

(e) Special Delivery Equipment Requirements:
(1) The vendor supplied GHe trailer will be utilized for up to three days to recharge the onsite GHe storage at Bldg. 233. Estimated quantity of requirement is 40,000 scf at 2250 psig min.
(2) Majority of 60 liter and 100 liter dewars are expected to be provided by JPL (see “Government Furnished Equipment”). Vendor to provide occasional 30 liter, and 250 liter dewar, plus any additional 60 liter and 100 liter dewars required by location. 60 liter dewar requirement specifically requires Cryofab model CMSH-60 dewars. Lift-gate on rear of dewar delivery truck is required for loading/off-loading dewars at time of delivery and pickup.
(3) Approximate Yearly Dewar Usage by Size:
   (i) 30 Liter: 2 dewars per year
   (ii) 60 Liter: 100 dewars per year
   (iii) 100 liters: 135 dewars per year
   (iv) 250 liters: 2 dewar per year

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. All delivery drivers to be pre-approved by JPL Security prior to access. The badging point of contact will ensure the drivers are issued temporary badges for admission onto JPL in accordance with current Personnel Identity Verification (PIV) requirements.

(g) Government-Furnished Equipment: There are approximately 30 Government owned 60 liter and 12 Government owned 100 liter dewars available for use at this delivery location.

(h) Special Delivery Conditions
(1) JPL will be closed except for time-critical project activities on alternative Fridays. This closure includes commercial shipments to and from JPL. Shipments which cannot be avoided to or from JPL on Friday closures must be scheduled in advance with JPL Shipping (7:30 AM - 4:15 PM PST) and/or Receiving (8:00 AM - 3:30 PM PST) at 818-393-5544 or 818-354-8511. Orders
normally will be placed by JPL before noon 2 working days prior to normal delivery days (i.e., Tuesday for Thursday delivery). Morning deliveries (prior to noon) are preferable. Alternate Fridays are not available for normal deliveries. Desired delivery days are Tuesday and Thursday. Vendor invoices should reference container serial numbers.

(2) Delivery of bulk GHe trailer will be coordinated approximately 1 month in advance of anticipated delivery date with delivery within 1 week of request for shipment.

(i) Geographic Location: JPL is a federally funded research and development facility managed by the California Institute of Technology for the National Aeronautics and Space Administration. In addition to its work for NASA, JPL conducts tasks for a variety of other federal agencies. JPL’s main 72-hectare (177-acre) site is at the foot of the San Gabriel Mountains near Pasadena, California, 19 kilometers (12 miles) northeast of Los Angeles.

(jj) Delivery Driver Directions: Enter JPL via the South Gate. Proceed to parking area in front of Receiving. Notify Receiving Clerk of delivery. Cryogenics personnel will escort truck to Building 338 for off-loading.

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

JOHNSON SPACE CENTER (JSC), CLIN 019/020/021/022

(a) Delivery Address
Johnson Space Center
B420 Receiving Area
Houston, TX 77058

(b) Delivery Hours
(1) Routine delivery hours: 7:30 a.m. - 3:30 p.m. (local time) Monday through Friday
(2) Emergency delivery hours: 24 hours per day, 7 days per week.

(c) Routine Requirements:
(1) Ultra high purity cylinder gas: 4,500 scf per month
(2) Grade A cylinder gas: 500 scf per month
(3) Dewar liquid: 300 liters per month (anticipated six times per year)
(4) Bulk gas: 50,000 scf per month, anticipated once a year

(d) Peak Requirements:
(1) Ultra high purity cylinder gas: 5,400 scf per month (anticipated up to 4 times a year)
(2) Grade A cylinder gas: 600 scf per month (anticipated 2 times a year)
(3) Dewar liquid: 500 liters per month (anticipated one time a year)
(4) Bulk gas: 100,000 scf per month (anticipated once per year). This would be anticipated to occur if multiple usage locations coordinate single trailer deliveries for support or testing requirements arise requiring additional support beyond routine requirement.

(e) Special Delivery Conditions:
(1) Turnaround time for cylinders is no later than 3 weeks from date of cylinder pick-up.
(2) Dewar delivery shall be within 72 hours after order is placed. If bulk GHe requires vendor supplied tube trailer, delivery shall be within 72 hours after order is placed. In emergency situations, requests for dewar or bulk GHe vendor supplied trailer delivery may be made with less than 72 hour notice and subject to Emergency Delivery Charge if accepted by supplier.
(3) Receipt of deliveries not available on alternate Fridays (“Flex Fridays”). If delivery is required on a Friday, location will ensure order placed to ensure delivery date is not a “Flex Friday”

(f) Special Delivery Equipment Requirements:
(1) For bulk gas, the tube trailers listed below (see “Government-Furnished Equipment”) may be removed from the delivery site, filled, and returned.
(2) Dewar delivery requirements: Contractor must supply all dewars. Normal dewar size will be 100 liters, but occasionally 200 liter and 500 liter dewars will be used. A delivery truck with life gate is required.
(3) Contractor required to inspect cylinders for hydrostatic testing, painting & replacement of valves as needed. All charges for cylinder testing, painting, repairs etc. will be per maintenance schedule.

(g) Special Access Requirements (i.e., security): Delivery vehicles subject to search prior to entry at JSC. All drivers required to be U.S. citizens. The contractor is required to obtain badges for delivery personnel for access to the Center. The contractor shall ensure that these badges remain current. Temporary badges can be obtained at Post 12 with prior coordination.

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(h) Government-Furnished Equipment:
   
   (1) Approximately 175 total gaseous helium cylinders are available.
   
   (2) One tube trailer is currently available for use at this delivery point with the following specifications:
      
      (i) 30 tubes on trailer
      
      (ii) 5500 psig maximum fill pressure (DOT 5000+ rating)
      
      (iii) Capacity: 80,000 SCF at 5000 psig/47,000 SCF at 2900 psig
      
      (iv) Note: Trailer included as available GFE trailer for fills to same pressure as provided with “standard pressure” vendor supplied tube trailers fills (up to ~3000 psi). The availability of the 5000 psi trailer does NOT imply a requirement for 5000 psi GHe in this contract.
      
      (v) The Government reserves the right to add/discontinue GFE trailers from the list of available GFE.

(i) Special Delivery Conditions: After pre entry inspection, all deliveries must first go to the receiving area (Bldg. 420). Following check-in, deliveries will be directed to their final destination.

(j) Geographic Location: JSC is adjacent to Clear Lake at 2101 NASA Road 1, about 20 miles southeast of downtown Houston via Interstate 45.

(k) Delivery Driver Directions: From 45 South, exit at Exit 26 (Bay Area Blvd). Head east on Bay Area Blvd, cross Highway 3 and turn right at Space Center Blvd. The delivery gate veers off to the right before the first light on Space Center at W. Linkage. Drivers will stop at Security gate (Post 12) for inspection, after which they will proceed to the receiving area (Bldg. 420). They will then be directed to final delivery location.

(End of text)
KENNEDY SPACE CENTER (KSC), CLIN 023/024/025

(a) Delivery Address
Propellant North Operations ISC-341
Building K7-416
Kennedy Space Center, FL  32899

(b) Delivery Hours
(1) Routine delivery hours:  6:00 a.m. - 2:30 p.m. (local time) Monday through Friday
(2) Emergency delivery hours:  24 hours per day, 7 days per week

(c) Routine Requirements (SLS = Space Launch System)
(1) Bulk liquid (Non SLS support/CLIN 024):  240,000 bulk liters per month in FY20 (Contract year 1), increasing to 320,000 liters per month for FY22 through FY25 (Contract years 2 through 5). Weekly requirement of up to 160,000 liters (anticipated up to three times a year) required for launch support at LC-39A (to support 2 launch attempts in 2 days).
(2) Bulk Liquid (SLS support/CLIN 025): 120,000 bulk liters per month, in support of SLS Wet Dress Rehearsal (WDR) anticipated once a year. Daily deliveries of 40,000 bulk liters to occur during week leading up to SLS Wet Dress Rehearsal. Requirement currently anticipated once in FY20 (Contract year 1), FY23 (Contract year 4) and FY24 (contract year 5).
(3) Dewar Liquid
   (i) 100 liters per month in 100 liter dewars, approximately 5 times per year
   (ii) 500 liters per month in 500 liter dewars, approximately 1 time per year

(d) Peak Requirements (SLS = Space Launch System):
(1) Bulk liquid (Non SLS support/CLIN 024):  320,000 bulk liters in a 6 day period. This requirement is anticipated approximately once a year for launch support at SLC-37, which requires support for 4 launch attempts in 6 days. Maximum daily deliveries of 80,000 liters.
(2) Bulk Liquid (SLS support/CLIN 025): 360,000 bulk liters in a 7 day period. This is anticipated to occur once a year in support of SLS launch operations for three launch attempts in a 7 day period. Daily deliveries of up to 120,000 liters anticipated during launch operations. 48-72 hours anticipated between launch attempts during 7 day SLS launch campaign. Peak requirement reflects multiple launch attempts that are required to be supported if needed. Requirement currently anticipated once in FY20 (Contract year 1), FY23 (Contract year 4) and FY24 (contract year 5).
(3) Dewar liquid
   (i) 200 liters per week in 100 liter dewars, anticipated once per year
   (ii) 1,000 liters per week in 500 liter dewars, anticipated once per year.

(e) Special Delivery Equipment Requirements: Only bulk liquid delivery tankers, nominally 40,000 liter capacity for bulk liquid deliveries. Dewar requirements: 100 liter and 500 liter dewars.

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. Entry into KSC is restricted to badged personnel only. The contractor is required to obtain badges for delivery personnel for access to the Center. The contractor shall ensure that these badges remain current.
(g) Special Delivery Conditions:

(1) Liquid tanker detention at KSC may occur for extended periods (up to 10 days) during launch activities. During launch operations at LC-39A, SLC-37 and during SLS launch operations additional tankers (in addition to the two tankers normally retained at KSC) may be retained at KSC.

(2) “Other Special Considerations”: For SLS launch requirements, additional LHe tankers will be required to support the second launch attempt (currently planned for 48 hours after the first attempt).

(3) For Bulk Liquid, the contractor shall deliver within 72 hours of receiving a request for shipment. Dewars will be provided with 4 days notice.

(h) Government-Furnished Equipment: Two bulk liquid tankers are available to support CLIN 024 (non SLS support) at this location. No bulk liquid tankers will be available to support CLIN 025 (SLS support) at this location. Two 100 liter dewars are available for use at this delivery location.

(1) The Contractor shall maintain the Government-Furnished tankers as part of the Contractor’s fleet. Contractor paint, designs and logos may be applied to the tankers. The Contractor shall repair and maintain the tankers in compliance with DOT regulations, and applicable safety standards. Repair work and workmanship must be in accordance with applicable DOT and American Society of Mechanical Engineers (ASME) codes. The Contractor shall also be responsible for any tanker modification work required due to changes in applicable DOT regulations for the transportation of helium. An on-going maintenance program for the tankers shall be in accordance with Contractor fleet standards. The tankers are to be used by the Contractor only in the Continental United States (CONUS), unless specifically approved in writing by the Contracting Officer.

(2) The Contractor shall provide the Government a copy of any design documentation utilized to modify or perform major repairs on the tankers. The Contractor shall document all changes that affect material compatibility or configuration of the tanker fluid system. Configuration changes must be coordinated and approved by the Contracting Officer prior to tanker modifications. The Contractor is not responsible for major modifications or repairs that exceed $15,000 per tanker per year, unless repairs are attributable to damage caused by a mishap while under the Contractor’s control. Tanker disposal, in the event a tanker is no longer usable, will be performed by the Government.

(3) The Contractor shall inspect the tankers prior to transfer and notify the Government of any discrepancies. Prior to transfer the Government will take appropriate action to correct all discrepancies at no cost to the Contractor. At a schedule mutually acceptable to both the Contractor and the Government, this inspection will take place at a mutually agreed upon location. The initiation of the inspection process and discrepancy correction will be made in a timely manner prior to the first scheduled helium delivery.

(4) Tanker Maintenance/Repair Responsibilities: Contractor shall be responsible for normal maintenance. Normal maintenance is defined as those activities required to keep the tanker operational and road worthy in accordance with the Contractor’s standard tanker maintenance program and in compliance with DOT regulations governing the transportation of liquid helium. Examples of normal maintenance include: (i) Repair and maintenance of automotive system such as tires, brakes, lighting, and running gear; (ii) Corrosion control of the carbon steel surfaces to prevent degradation of structural members and outer shell; (iii) Maintenance, repair, and like item replacement of tank fluid system to include piping, valves
and components; (iv) Calibration of gauges and relief devices in accordance with DOT requirements; (v) Maintenance of fluid system and inner tank cleanliness integrity; (vi) Maintenance of vacuum integrity, such as periodic pumping; (vii) Tanker modification required to facilitate fill operations at Contractor’s location(s); (viii) Minor welding repair to structural members; (ix) Modifications to the fleet of Government-furnished tankers for upgrades to comply with DOT regulations for which the total cost is less than $15,000 per each individual directive for all Government-furnished tankers combined; (x) Inspection and marking of tanker to meet DOT regulations.

(5) Periodic Tanker Refurbishment: Contractor shall be responsible for periodic refurbishment. Periodic refurbishment is defined as a program that occurs approximately every ten years where the overall condition of the tanker is assessed and reviewed for DOT compliance. Periodic refurbishment will normally include such things as: (i) Sandblasting and repainting of the tanker; (ii) Disassembly, inspection, and maintenance of running gear; (iii) Fluid system inspection and cleaning, as required.

(6) Tanker Mishap: Contractor shall be responsible for any repair/restoration due to damage from vehicle mishap while under Contractor control.

(7) Major Modification: The Government will be responsible for major modification and repair required to maintain the life of the tanker. Major modification work will include such items as: (i) Work to repair, replace, or restore insulation or “getter” material; (ii) Vacuum repairs to the tanker requiring cutting and welding on inner and/or outer vessel; (iii) Major repairs required to maintain acceptable one-way travel time; (iv) Modifications to the tanker required for delivery of product at Government locations; (v) Replacement of major structural material; (vi) Replacement of major automotive items such as bogie assembly; (vii) Major repair to correct damage as a result of acts of God or when tanker is under control of the Government.

(i) Other Special Considerations:

(1) Tanker Rental (i.e., detention of tankers):
   (i) Non SLS support/CLIN 024: Since the Government is providing 2 liquid tankers for the Contractor to use in performance of this contract, no rental charges will be assessed for up to 2 tankers detained at KSC.
   (ii) SLS support/CLIN 025: Since the Government is not providing any liquid tankers for the Contractor to use in performance of this contract, rental charges will be assessed for all tankers detained at KSC in support of this CLIN.

(2) Liquid dewars: The Government will provide two 100 liter dewars to the contractor to fill dewar requirements identified in the Schedule. These dewars may be retained at the contractor’s facility until delivery required. In the absence of available Government dewars, contractor owned dewars will be provided. Because the Government is providing two 100 liter dewars for use in performance of this contract, no rental charges will be assessed for up to two 100 liter dewars detained at KSC.

(3) One-way charges: In the event the Contractor is directed to drop or pick up a tanker at KSC and is unable to haul another tanker for ½ the route (also known as a dead-head or bob-tail run) the Government will incur a one-way charge. In the event the Contractor is directed to drop off or pick up a dewar at KSC and is unable to haul another dewar for ½ the route (also known as a dead-head or bob-tail run) the Government will incur a one-way charge.

(4) Demurrage (Driver Delay): The following are specific to demurrage at KSC only.
i) Demurrage to start with arrival of tanker at CCF (per scheduled arrival time)

(ii) Maximum of 8 hours of total demurrage (4 hrs grace period + 4 hrs charged at the contract rate) guaranteed by supplier after arrival at CCF (per scheduled arrival time).

(iii) After 8 hours of total demurrage, it will be at the Contractor’s option whether to continue demurrage further (to wait until an empty container is ready for return). If the Contractor decides to continue demurrage beyond 8 hours, demurrage charges will continue to be incurred until the driver’s departure with an empty container. If the Contractor decides to depart without an empty container (following 8 hours of total demurrage), the Government will incur one way mileage (also known as a dead-head or bob-tail run mileage) charges from KSC back to the Contractors Facility. It is understood that when the Contractor decides to depart KSC without an empty container (following 8 hours of total demurrage), an additional one-way mileage charge will be incurred by the Government for the one way miles required to pick up the additional container from KSC at a later time.

5) Additional Launch support information:

(i) Wet Dress Rehearsals (using equivalent of one launch attempt with scrub) for SLS, and SLC-37 are anticipated approximately one month prior to launch. Static Fire tests (using equivalent of one launch attempt with scrub) for launches at LC-39A and SLC-40 are anticipated for selected missions, normally within a week of launch.

(ii) For Peak requirement in support of SLC-37 launch operations (4 launch attempts in 6 days), 24 hrs anticipated between launch attempts #1 and 2, followed by a 48 hour break then two more launch attempts with 24 hrs between attempts #3 and 4. Daily deliveries of up to 80,000 liters anticipated during launch operations.

(iii) For weekly routine requirement in support of LC-39A launch operations (2 launch attempts in 2 days, anticipated three times a year), 24 hrs anticipated between first and second launch attempts. Daily deliveries of up to 80,000 liters anticipated during launch operations.

(j) Geographic Location: KSC is located approximately 40 miles east of Orlando, Florida, and 2 miles south of Titusville, Florida.

(k) Delivery Driver Directions: Deliveries shall be made direct to NASA, Kennedy Space Center, Florida, Building K7-468, KSC Propellants North CCF Area. The driver will obtain a visitor badge at the Visitor Pass and ID station located just west of Gate 3 on State Road 405. After obtaining a badge proceed to Gate 3 for security check. After Gate 3 drive approximately 1/4 miles east to exit ramp marked “TO VAB” (just prior to the SR 3 overpass). The driver will exit, turn left and travel north approximately 4 miles to Saturn Causeway. Turn right on Saturn Causeway and proceed past the VAB and around the curve. Approximately 3/4 mile past the curve, the driver will turn left (north) on to Fluid Servicing Rd, which crosses the gravel crawler-way. Check in with the CCF operations Lead Technician in Building K7-468, the first building on the right after crossing the gravel Crawler-way.

(l) Indian River Bridge restrictions:

(i) There are new weight restrictions for commercial trucks crossing the Indian River Bridge, effective July 1st 2019:
(A) Single Unit Truck (SU): 10 Tons
(B) Truck Tractor Semi-Trailer (C): 14 Tons
(C) Single Unit Truck W/One Trailer (ST): 16 Tons

(ii) For LHe tankers and possibly some dewar delivery vehicles, the Indian River Bridge will not be usable for deliveries. The following information is provided to access the Visitor Pass and ID station (located just west of Gate 3 on State Road 405) without using the Indian River Bridge:

I-95 S. to SR 528 East. SR 528 East to SR 3 North. SR 3 North to Space Commerce Way. Left onto Space Commerce Way to NASA Causeway/ State Road 405. Turn right onto NASA Causeway/ State Road 405 to Visitor Pass and ID station (located just west of Gate 3 on State Road 405).
ATTACHMENT 1 – STATEMENTS OF WORK

LANGLEY RESEARCH CENTER (LaRC), CLIN 026

(a) Delivery Address
Langley Research Center
Building 1206
Hampton, VA 23681

(b) Delivery Hours
(1) Routine delivery hours: 7:30 a.m.- 2:00 p.m. (local time) Monday through Friday
(2) Emergency delivery hours: 24 hours per day, 7 days per week

(c) Routine Requirements:
(1) LHe: 160 liters per month in 60 and 100 liter dewars. Routine requirement anticipated five times a year.

(d) Peak Requirements:
(1) LHe: 300 liters per month, anticipated 1 time per year.

(e) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. The contractor is required to obtain badges for delivery personnel for access to the Center. The contractor shall ensure that these badges remain current.

(f) Special Delivery Conditions: Contractor to provide all dewars. 60 and 100 liter dewars required Dewar delivery within 72 hours of ordering.

(g) Government furnished equipment: None.

(h) Geographic Location: Hampton, Virginia, Hampton Roads region of southeast Virginia

(i) Delivery Driver Directions:
(1) From Richmond/Williamsburg/Newport News Area: Take I-64 east to Exit 261B, Hampton Roads Center Parkway, NASA Exit; Proceed to the end of the Parkway (approximately 1.8 miles), moving into the left lane; Turn left onto Armistead Avenue towards NASA/Langley Air Force Base; Go past the Langley Air Force Base West Gate, moving into the right lane (approximately 1.2 miles); Exit off Armistead Avenue to Commander Shepard Blvd and the NASA Main Gate.

(2) From Norfolk Area: Take I-64 west through the Hampton Roads Bridge Tunnel; Remain on I-64 west to Exit 262B, Magruder Blvd; Remain on Magruder Blvd through three (3) traffic lights, moving into the right lane; Exit off Magruder Blvd onto Commander Shepard Blvd (Route 172 North, marked "NASA") (approximately 1 mile from last traffic light, and before the overpass); Remain on Commander Shepard Blvd through the traffic light (approximately 1.2 miles), and you will be at the NASA Main Gate.

(3) From Isle of Wight Area: Take Route 17 North over the James River Bridge (Route 17 becomes Mercury Blvd at this point); Continue on Mercury Blvd to the I-64 intersection (approximately 4 miles); Get on I-64, heading West; stay in the right lane on I-64 West to Exit 262B, Magruder Blvd; Remain on Magruder Blvd onto Commander Shepard Blvd. (Route 172 North, marked "NASA") (approximately 1 mile from last traffic light, and before the overpass); Remain on Commander Shepard Blvd through the traffic light (approximately 1.2 miles), and you will be at the NASA Main Gate.
ATTACHMENT 1 – STATEMENTS OF WORK

(4) From Hampton: get on I-64 west to Exit 262B, Magruder Blvd, to NASA; Proceed north on Magruder Blvd (approximately 1.5 miles); Exit Magruder Blvd at ramp to NASA/Langley Air Force Base, Route 172 north; Continue on Route 172 north to NASA Main Gate (approximately 1.2 miles).

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

MARSHALL SPACE FLIGHT CENTER (MSFC), CLIN 027/028

(a) Delivery Address

Marshall Space Flight Center

Marshall Space Flight Center, AL 35812

(b) Delivery Hours

(1) Routine delivery hours:
   (i) Bulk Gas deliveries: 7:00 a.m.- 2:00 p.m. Monday through Friday
   (ii) Dewar deliveries: 8:00 a.m. - 4:00 p.m. (local time) Monday through Friday.

(2) Emergency delivery hours: 24 hours per day, 7 days per week.

(c) Routine Requirements:

(1) Dewar liquid: 100 liters per month

(2) Bulk gas:
   (i) Contract Years 1-2 (FY20-21): 360,000 scf per month estimated 6 times per year, decreasing to 180,000 scf per month estimated 6 times per year. Weekly deliveries of 180,000 scf anticipated.
   (ii) Contract Years 3-5 (FY22-24): 270,000 scf per month estimated 6 times per year, decreasing to 110,000 scf per month estimated 6 times per year.

(d) Peak Requirements:

(1) Dewar liquid: 3,500 liters per month, anticipated once per year

(2) Bulk gas:
   (i) Contract Years 1-2 (FY20-21): 540,000 scf per month, anticipated once per year.
   (ii) Contract Years 3-5 (FY22-24): 430,000 scf per month, anticipated once per year.

(e) Special Delivery Equipment Requirements:

(1) Contractor must supply all dewars. Normal dewar size will be 250 liters, but occasionally 100 liter and 500 liter dewars will be used. 100 liter and 250 liter size dewars must be nonmagnetic dewars, 500 liter size dewars occasionally may require nonmagnetic dewars

(2) Bulk gas deliveries require trailer connection adaptable to ½ inch AN (AN-8) fitting. For Bulk Gas, the Contractor trailers shall be parked at one of 2 unloading stations at Building 4676. They will be connected through GFE flex hoses to a GFE helium compression system which will boost the helium pressure and fill into GFE helium storage vessels. The receiver vessel volume is 330,000 scf at the maximum allowable pressure of 4,000 psig. Typical receiver vessel pressure at the time of delivery is 1,000 psig. Typical unload time is 8 hours.

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. The contractor is required to obtain badges for delivery personnel for access to the Center. The contractor shall ensure that these badges remain current.

(g) Government furnished equipment: None.

(h) Special Delivery Conditions:

(1) Liquid dewars: Contractor must supply all dewars.

(2) Bulk gas deliveries: The Government may, at its option, retain the delivered vendor tube trailer for up to 30 days.
Normal delivery within **72** hours of receiving a request for shipment. In emergency situations, requests for dewar or bulk GHe delivery may be made with less than 72 hour notice and subject to Emergency Delivery charge if accepted by supplier.

(i) Geographic Location: Redstone Arsenal, Huntsville, Alabama

(j) Delivery Driver Directions: Approaching Huntsville from west I-565, exit at South Memorial Parkway and head south. Take the Martin Road exit (west) that leads into MSFC, through Gate 1. All deliveries must come through this gate for inspection.

(1) Liquid Dewar Delivery: Liquid dewar delivery shall be made to Central Receiving in Building 4631 for processing and distribution to Building 4481. Central Receiving: From Gate 1, proceed west on Martin Road and turn left on Dodd Road (south). Turn right (west) on Fowler Road. Turn left on Saturn. Central Receiving is located in Building 4631 on the right.

(2) For Bulk Gaseous Helium Deliveries: From Gate 1 proceed west on Martin Road. Turn left at Dodd road. Building 4659 is on the right side of Dodd Road 6 or seven buildings down. It is recessed from the road. The driver shall check in at the truck scale weigh house located by a semi-trailer parking lot in front of the building. During normal delivery hours, the driver should use the truck horn if the weigh scale house is unoccupied. If a delivery is to be made outside of normal hours, special arrangements must be made. The telephone number at the receiving facility is (256) 544-9456.

(End of text)
(a) Delivery Address
Michoud Assembly Facility
13800 Old Gentilly Road
New Orleans, LA  70129

(b) Delivery Hours
(1) Routine delivery hours:  8:00 a.m.- 3:00 p.m.(local time) Monday through Friday
(2) Emergency delivery hours:  24 hours per day, 7 days per week
(3) NOTE:  MAF helium requirements must be met 365 days per year, without interruption.

(c) Routine Requirements
(1) Liquid dewars:  3500 liters per month.
(2) Bulk Gas:  100,000 scf per month.

(d) Peak Requirements
(1) Liquid dewars:  4500 liters per month
(2) Bulk Gas:  1,000,000 scf per month anticipated once per year.  Highest weekly order anticipated of 360,000 scf. These peak requirements are based on continuation of SLS Core Stage Program at MAF.

(e) Special Delivery Equipment Requirements
(1) Liquid dewars:  500 liter dewars only
(2) Bulk gas:  User will normally order compressed gas trailers for “drop and swap” deliveries to MAF. Trailers should contain a minimum of 160,000 scf bulk gas at a minimum pressure of 3,000 psi. Higher pressure is desired, if available.

(f) Special Access Requirements (i.e., security):  All drivers required to be US citizens. Drivers are screened at gate entry by review of the following info:
(1) Identification (Commercial Driver’s License and employee ID)
(2) Manifest with on-site destination indicated.

(g) Government-Furnished Equipment:  Approximately thirty-six 500 liter dewars are available.

(h) Special Delivery Conditions:
(1) Occasional requirement for 24 hour delivery. The “short notice emergency delivery charge” will apply for these 24 hour deliveries. Normal requirement is 72 hour delivery.
(2) Peak Requirements are for support of Space Launch System (SLS) hardware testing currently anticipated to occur during each Contract Year. Requirement planning is based on one (1) Final Integrated Functional Test (FIFT) Phase per Contract Year which requires approximately 5 tube trailers ordered back-to-back to support a continuous “drop and swap” delivery method.
(i) POCs and Ship To Address:

(1) Liquid Dewars:
   (i) Ship to: Michoud Assembly Facility, 13800 Old Gentilly Road, New Orleans, LA, 70129
   (ii) Primary POC: Lynette St Ann, Phone: 504-257-3165.
   (iii) Backup POC: Keith Ponchot, Phone: 504-257-0799.

(2) Gaseous Bulk:
   (i) Ship to: Michoud Assembly Facility, 13800 Old Gentilly Road, New Orleans, LA, 70129
   (ii) Primary POC: Catriona Ladner-Shaw, Phone: 228-688-2250.
   (iii) Backup POC: Chip Howat, Phone: 504-257-0478

(j) Geographic Location: The 832 acre NASA MAF is located in New Orleans, Louisiana some 24 miles from New Orleans International Airport and 15 miles from the French Quarter.

(k) Delivery Driver Directions:

(1) From the New Orleans International Airport: Look for the I-10 East signs as you leave the airport. Take Airport Access Road to I-10 East. Go eastbound on I-10 for about 7 miles. At that point, the interstate splits into I-10 and I-610. Take the on I-610 fork. Travel 7 miles until you reach the I-10/I-510 interchange (Exit 246A). Refer to the last section for directions to MAF from the I-510.

(2) From Slidell, Louisiana or points east: Proceed west on I-10. After Slidell, Louisiana, I-10 crosses Lake Ponchartrain. Proceed approximately 14 miles after you cross the lake to the I-10/I-510 interchange (Exit 246A). Refer to the next section for directions to MAF from the I-510.

(3) To reach MAF via the I-510: Turn on to I-510 from I-10 (south, headed toward Chalmette). Proceed south on I-510 to Exit 2C (third exit). Take Exit 2C, then first left. At stop sign, turn left again, crossing over I-510. Go east 0.7 miles on Old Gentilly Road. MAF will be on your right. Go straight through traffic light at intersection of Michoud Blvd and Old Gentilly Road. Proceed as directed below.

   (i) Liquid Helium Dewar Deliveries: Take Old Gentilly Road to Gate 12 (Gate for Contractors), Proceed to loading docks on the South side of Building 103. Guard at gate can provide directions.

   (ii) Bulk Gaseous Helium Deliveries: Take Old Gentilly Road to Gate 12 (Gate for Contractors), Proceed to Building 103 W. Concrete Apron on the west side of Vertical Assembly Building (VAB). Guard at gate can provide directions.

(End of text)
ATTACHMENT 1 – STATEMENTS OF WORK

STENNIS SPACE CENTER (SSC), CLIN 031

(a) Delivery Address
    John C. Stennis Space Center
    Building 3305
    Stennis Space Center, MS 39529

(b) Delivery Hours
    (1) Routine delivery hours: 7:00 a.m. - 10:00 p.m. (local time), Monday through Friday
    (2) Emergency delivery hours: 24 hours per day, 7 days per week.

(c) Routine Requirements: 1,260,000 scf per month.

(d) Peak Requirements: 2,160,000 scf per month.
    (1) Highest projected daily order is estimated to be 360,000 scf.
    (2) The highest projected weekly order is estimated to be 1,080,000 scf, occurring approximately 6 times per year.
    (3) Peak requirements anticipated to occur during Space Launch System (SLS) stage testing, currently scheduled to start early in Contract Year 2 for a period of approximately five months.

(e) Special Delivery Conditions: Normal delivery within 48 hours of receiving a request for shipment.

(f) Special Access Requirements (i.e., security): All drivers required to be U.S. citizens. Entry into SSC is restricted to badged personnel only. The contractor is required to obtain badges for delivery personnel for access to the Center. The drivers who deliver to SSC on a regular basis (at least 3 times per week) complete a NCHC background check. They are badged for up to one-year at a time or the length of contract. Part time or fill-in drivers are badged as needed for access to SSC. If the request is going to exceed 29 days then a NCHC is submitted. However, Security advises the individual companies to complete some type of background check involving FBI fingerprint checks. The contractor shall ensure that these badges remain current.

(g) Government furnished equipment: None.

(h) Geographic Location: The John C. Stennis Space Center (SSC) is located in Hancock County, Mississippi, and is located approximately 50 miles east of New Orleans, Louisiana.

(i) Delivery Driver Directions: Helium deliveries shall be made directly to NASA, Stennis Space Center, Mississippi, Building 3305, High Pressure Gas Facility. The driver will enter the South Gate, just north of Interstate 10 (Exit 2). The driver will proceed through the gate on Trent Lott Parkway, approximately 2.1 miles; to the third traffic light, intersection of Trent Lott Parkway and Saturn Drive. The driver will then turn right (east) onto Saturn Drive and go approximately 1.4 miles to Building 3305. Turn right and go through the entrance to Building 3305, High Pressure Gas Facility.

(End of text)
WHITE SANDS TEST FACILITY (WSTF), CLIN 032

(a) Delivery Address
JSC White Sands Test Facility
12600 NASA Road
Las Cruces, NM  88012

(b) Delivery Hours
   (1) Routine delivery hours:  7:30 a.m. - 2:00 p.m. (local time) Monday through Friday
   (2) Emergency delivery hours:  24 hours per day, 7 days per week.

(c) Routine Requirements:  165,000 scf per week to occur  approximately 12 times per year

(d) Peak Requirements:  330,000 scf per week to occur once a year. This may occur in addition to
    routine weekly requirements.

(e) Special Delivery Equipment Requirements: Connections adaptable to Standard “AN” fittings. Bulk
gas minimum offload pressure:  600 psig. Bulk gas deliveries will normally involve cascade into
location’s gaseous helium storage (max operating pressure of 2400 psi). Estimated off-load time
(including potential sampling) is approximately 5 hours when 3000 psi trailers are used.
Approximately once a year, test requirements will require the bulk gas trailer to remain at the
location for up to 5 weeks.

(f) Special Access Requirements (i.e., security): Drivers are required to be U.S Citizens or lawful
permanent resident, to be verified by the WSTF Security Office. A list of drivers should be sent to
WSTF to decrease waiting time for drivers and to provide prior validation for drivers. Drivers will be
escorted upon arrival at the location. Escorted drivers will require individual badging. Drivers
should be prepared to show driver’s license and vehicle registration and for vehicle searches.

(g) Government-Furnished Equipment: None.

(h) Special Delivery Conditions:
   (1) WSTF is closed on alternate Fridays (“Flex Fridays”). Receipt of deliveries not available on
these alternate Fridays. If delivery is required on a Friday, location will ensure order placed to
ensure delivery date is not a “Flex Friday”

   (2) Deliveries within 72 hours of ordering. In emergency situations, requests for delivery may be
made with less than 72 hour notice and subject to Emergency Delivery charge if accepted by
supplier.

(i) Ship To Address:
   Ryan Maurer
   Mail Code: RD
   NASA JSC, White Sands Test Facility, 12600 NASA Road
   Las Cruces, NM  88012
   Phone: 575-524-5492; Cell: 575-551-8307
   (Alternate: Earl Cason; Mail Code: RD; Phone: 575-524-5479; Cell: 575-491-4282)

(j) Geographic Location: WSTF is remotely located on the west slope of the San Andres mountains
between Las Cruces, New Mexico, and the White Sands Missile Range, about 20 miles Northeast of
Las Cruces, New Mexico.
(k) Delivery Driver Directions: From Las Cruces, NM, go east on highway 70, 10.5 miles from the I-25 exit 6. Turn north at the NASA/Baylor Canyon exit and go 6 miles. Stop at the guard gate. You will be directed to the weigh scales, and escorted from that point. (End of text)
## DELIVERY LOCATION CONTACTS

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