National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD 20771

Reply to Attn of:
250

RECORD OF ENVIRONMENTAL CONSIDERATION

The National Environmental Policy Act (NEPA) Compliance Joint Polar Satellite System (JPSS-2, JPSS-3 and JPSS-4)

1.0 Introduction

The NEPA of 1969, as amended (42 U.S.C. 4321, et seq.), requires Federal agencies to consider the environmental impacts of a project in their decision making process. To comply with NEPA and associated regulations (the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA [40 CFR Parts 1500-1508] and NASA policy and procedures [14 CFR, Part 1216, Subpart 1216.3]), NASA has prepared an Environmental Assessment (EA) for routine payloads launched on expendable launch vehicles (Ref: Environmental Assessment (Final) for Launch of NASA Routine Payloads, November 2011). The 2011 NASA Routine Payload EA (NRPEA) assesses the environmental impacts of missions launched with spacecraft that are considered routine payloads from existing launch facilities at Cape Canaveral Air Force Station (CCAFS), Florida, Vandenberg Air Force Base (VAFB), California, the United States Army Kwajalein Atoll/Reagan Test Site (USAKA/RTS) in the Republic of the Marshall Islands (RMI), NASA's Wallops Flight Facility (WFF), Virginia, and the Kodiak Launch Complex (KLC), Alaska.

Spacecraft defined as routine payloads utilize materials, quantities of materials, launch vehicles, launch sites, and operational characteristics that are consistent with normal and routine spacecraft preparation and flight activities at VAFB, CCAFS, USAKA/RTS, WFF, KLC, and the Kennedy Space Center. The environmental impacts of launching routine payloads from these sites fall within the range of routine, ongoing, and previously documented impacts that have been determined not to be significant. Spacecraft within the scope of this EA meet specific criteria ensuring that the spacecraft, its operation, and decommissioning, do not present any new or substantial environmental or safety concerns.

To determine the applicability of a routine payload classification for a mission, the mission is evaluated against the criteria defined in the EA using the Routine Payload Checklist (RPC).

2.0 Mission Description

The JPSS program is the restructured civilian portion of the National Polar-orbiting Operational Environmental Satellite System. Polar-orbiting satellites observe Earth from space and collect and disseminate data on Earth's weather, atmosphere, oceans, land, and near-space environment

and are able to monitor the entire planet and provide data for long-range weather and climate forecasts.

JPSS is a partnership between National Oceanic and Atmospheric Administration (NOAA) and NASA for the next generation of polar Earth observing science data satellites that will make afternoon observations as it orbits Earth. NOAA is responsible for the overall program and is also responsible for operations, data exploitation and archiving, and infrastructure. NASA is the acquisition agent for the ground systems and flight systems (satellite, instruments, and launch vehicle), and leads program systems engineering, program safety and mission assurance activities

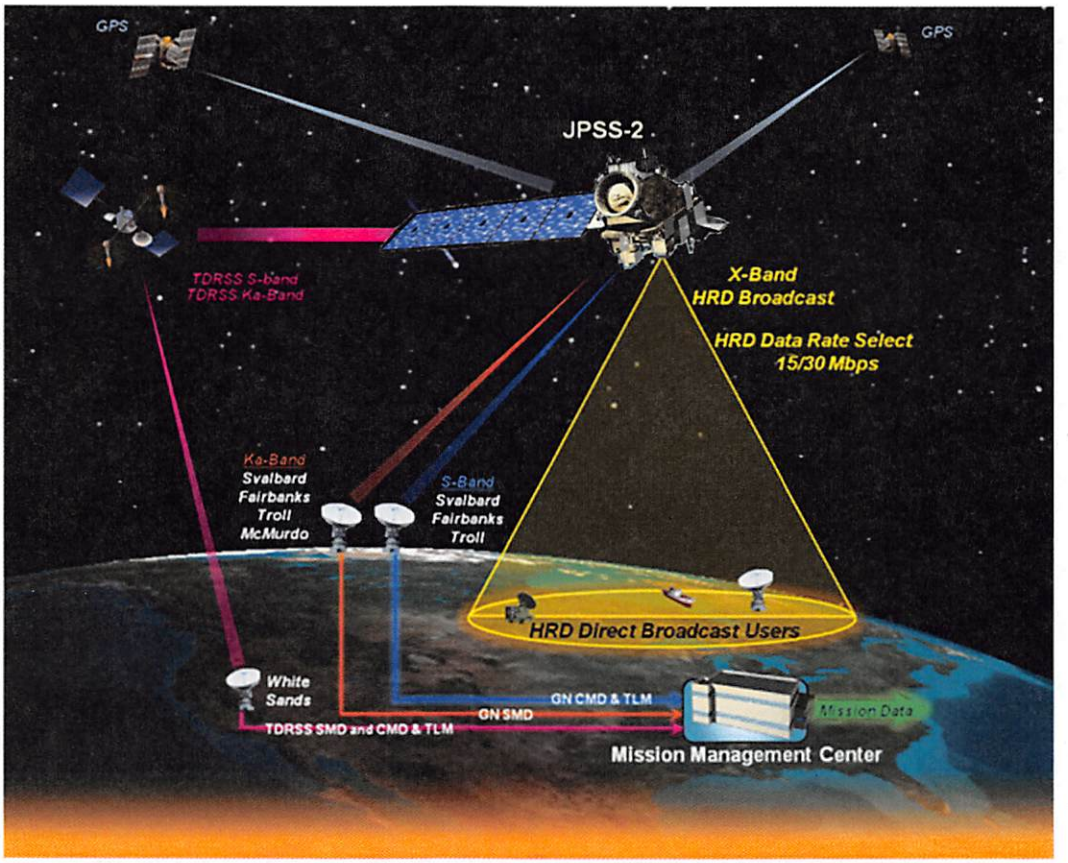
JPSS provides global imagery and atmospheric measurements using polar-orbiting satellites. The JPSS mission objective is to sustain continuity of and enhance Earth observation analysis, forecasting, and climate monitoring capabilities from global polar-orbiting observations.

JPSS provides enhanced global environmental data used in numerical weather prediction models for forecasts, as well as provide space weather observations, search and rescue detection capabilities, and direct read-out and data collection products and services to customers. Data and imagery obtained from JPSS increases timeliness and accuracy of public warnings and forecasts of climate and weather events, thus reducing the potential loss of human life and property and advancing the national economy.

The JPSS program consists of five satellites (Suomi-National Polar-orbiting Partnership (NPP), JPSS-1, JPSS-2, JPSS-3, and JPSS-4), ground systems, and operations through 2038. Suomi-NPP was launched in October 2011, and is currently in operation. JPSS-1 is planned to launch from VAFB in early 2017 aboard a United Launch Alliance Delta II rocket. The ground system consists of the command, control, and communications segment, the interface data processing segment for science data processing, and the field terminal segment for support to direct broadcast users.

The JPSS-2 satellite utilizes a new spacecraft design with the same instrument suite as Suomi-NPP and JPSS-1, but with a new Radiation Budget Instrument, which replaces the obsolete Clouds and the Earth's Radiant Energy System instrument (see below). JPSS-3 and JPSS-4 will be identical to JPSS-2. The launch of JPSS-2 is currently planned for mid-2021 from VAFB, followed by JPSS-3 in 2026 and JPSS-4 in 2031. At this time the launch vehicles have not been selected for JPSS-2, JPSS-3, or JPSS-4.

Satellite characteristics	
Lifetime: 7 yr (Satellite)	
Mass: 2790 kg	Power: 1995 W
Dimensions (in launch configuration): H: 145" x Dia.: 52"	
Communications: S-band: Command & Telemetry via Svalbard and Tracking and Data Relay Satellite (TDRS); Ka-band: 300 Mbps Science Mission Data link to ground and TDRS System; X-band: 25 Mbps High-Rate Data link to direct users	



JPSS Instrument		Measurement
	**ATMS** - Advanced Technology Microwave Sounder	ATMS and CrIS together provide profiles of atmospheric temperature, moisture, and pressure
	**CrIS** - Cross-track Infrared Sounder	
	**VIIRS** – Visible Infrared Imaging Radiometer Suite	Provides daily high-resolution imagery and radiometry across the visible to long wave infrared spectrum
	**OMPS** - Ozone Mapping and Profiler Suite	Spectrometer with UV bands for ozone total column measurements
	**RBI*** - Radiation Budget Instrument	Scanning radiometer which supports studies of Earth Radiation Budget

*Replaces the Clouds and the Earth's Radiant Energy System (CERES) flown on SNPP and JPSS-1

3.0 NASA Routine Payload Determination

The components utilized in the JPSS-2, JPSS-3, and JPSS-4 satellites are made of materials normally encountered in the space industry. The JPSS-2, JPSS-3, and JPSS-4 missions will not utilize radioactive sources or lasers, will not carry any pathogenic organisms, and will not return samples to Earth. A controlled reentry is planned for all JPSS satellites.

The JPSS-2, JPSS-3, and JPSS-4 missions have been evaluated against the 2011 NRPEA, using the RPC (see enclosed evaluation recommendation package). The evaluation indicates that JPSS-2, JPSS-3, and JPSS-4 satellites meet the criteria for a routine payload and fall within the scope of the reference EA. The launch vehicles have yet to be selected; however, the candidate launch vehicle/launch site combinations all fall within the scope of the EA. The site-specific impacts of these combinations are addressed in the EA. JPSS-2, JPSS-3, and JPSS-4 satellites do not present any unique or unusual circumstances that could result in new or substantial environmental impacts. Based on the analyses set forth in the 2011 NRPEA, NASA has determined that the environmental impacts associated with JPSS-2, JPSS-3, and JPSS-4 satellites will not individually or cumulatively have a significant impact on the quality of the human environment and that a routine payload classification for these missions is applicable. No additional NEPA action or documentation is required at this time. Once launch vehicle selections have occurred, the missions will be reviewed to ensure that a routine payload classification is still valid.

David F. Mitchell — 7/21/16

David F. Mitchell
Director of Flight Projects

Date

C. J. Scolese — 19 August 2016

Christopher J. Scolese
Director

Date

Enclosure

cc:
470/Mr. P. Burch
472/Mr. B. Fafaul

EVALUATION RECOMMENDATION PACKAGE

Record of Environmental Consideration
Routine Payload Checklist
Flight Project Environmental Checklist

Enclosure

NASA Goddard Space Flight Center
RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

PROJECT NAME: Joint Polar Satellite System (JPSS) -2, -3, -4

1. **Description of proposed action:** The development, testing, launch and early orbit checkout of the JPSS satellites. The JPSS mission objectives are to sustain continuity of and enhance NOAA's Earth observation analysis, forecasting and climate monitoring capabilities from global polar-orbiting observations.

   Date and/or Duration of project: Launch: J-2 mid-2021, J-3 in 2026, J-4 in 2031

2. **It has been determined that the above action:**

☒ a. Is adequately covered in an existing EA or EIS.
   Title: *Environmental Assessment for Launch of NASA Routine Payloads*
   Date: November 2011

☐ b. Qualifies for Categorical Exclusion and has no extraordinary circumstances per 14 CFR 1216.304 (c) which would suggest a need for an Environmental Assessment.
   Categorical Exclusion: _____

☐ c. Has no significant environmental impacts as indicated by the results of an environmental checklist and/or detailed environmental analysis.

☐ d. Is exempt from NEPA requirements under the provisions of: _____

☐ e. Will require the preparation of an Environmental Assessment.

☐ f. Will require the preparation of an Environmental Impact Statement.

☐ g. Is addressed under EO12114.

- ☐ Is exempt from EO12114 requirements under the provisions of: _____
- ☐ Action not included under EO12114: _____
- ☐ Qualifies for an EO12114 categorical exclusion: _____
- ☐ Is adequately covered in existing documentation: _____
- ☐ Requires an environmental summary document: _____
- ☐ Requires EO documentation IAW 2-4. (a) i, ii, iii: _____

☐ h. Is not federalized sufficiently to qualify as a major federal action.

Beth Montgomery — 7/11/16

Beth Montgomery, NEPA Program Manager, Code 250 — Date

Bryan Fafaul — 7/15/16

Bryan Fafaul, Project Manager, Code 472 — Date

NASA Routine Payload Evaluation and Determination Process and Checklist

After a proposed spacecraft mission is sufficiently well formulated (usually the Phase B design study), the Sponsoring Entity, in coordination with the local Environmental Management Office (EMO), will prepare an environmental evaluation. An environmental evaluation is a preliminary review that determines what aspects of the proposal are of potential environmental concern. The environmental evaluation also assists in determining the appropriate level of National Environmental Policy Act (NEPA) documentation (i.e., environmental assessment [EA], or environmental impact statement [IEIS]) for the proposal. The local EMO uses a comprehensive checklist to provide a level of rigor to this early evaluation of the proposal, helping to ensure that pertinent considerations are not overlooked. Local EMO review of the Routine Payload Checklist (RPC, below) forms the basis for evaluating the applicability of a NASA Routine Payload (NRP) spacecraft classification for a proposed mission.

The local EMO uses the completed RPC (and required attachments) to evaluate the proposed mission against the NRP EA criteria. If the EMO evaluation of the RPC indicates that a NRP categorization may be appropriate, the Sponsoring Entity documents this in an Evaluation Recommendation Package (ERP). The ERP is then processed for review and approval in accordance with established National Aeronautics and Space Administration (NASA) procedures and guidelines. If approved, the ERP would be attached to a Record of Environmental Consideration (REC).

The Sponsoring Entity can then proceed with the proposal while monitoring the project activities, for changes or circumstances during implementation that could affect classification of the proposed mission as a NRP spacecraft. If a NRP spacecraft categorization is determined to be inappropriate, the local EMO will initiate plans for preparation of additional NEPA documentation.

NASA Routine Payload Checklist

Project Name: Joint Polar Satellite System (JPSS), JPSS-2 and JPSS Polar Follow Missions (JPSS-3 and JPSS-4), Flight Project		Date of Launch: 07/21; 07/26, 07/31
Project Contact: Bryan A. Fafaul	Phone Number: 240-684-0602	Mailstop: 472
Project Start Date: Jul 2010	Project Location: GSFC, Greenbelt, MD	

Project Description:
The NASA GSFC Code 472 organization that manages the development, testing, launch and early orbit checkout of the JPSS satellites.

	Yes	No
A. Sample Return:		
1. Would the candidate mission return a sample from an extraterrestrial body?	☐	☒
B. Radioactive Materials:	Yes	No
1. Would the candidate spacecraft carry radioactive materials in quantities that produce an A2 mission multiple value of 10 or more?	☐	☒
Provide a copy of the Radioactive Materials On Board Report as per NPR 8715.3 with the ERP submittal.	Attachment	
C. Launch and Launch Vehicles:	Yes	No
1. Would the candidate spacecraft be launched on a vehicle and launch site combination other than those indicated in Table C-1 on Page 2?	☐	☒
2. Would the proposed mission exceed the approved or permitted annual launch rate for the particular launch vehicle or launch site?	☐	☒
Comments:		
D. Facilities:	Yes	No
1. Would the candidate mission require the construction of any new facilities or substantial modification of existing facilities?	☐	☒
Provide a brief description of the construction or modification required, including whether ground disturbance and/or excavation would occur.		
E. Health and Safety:	Yes	No
1. Would the candidate spacecraft utilize batteries, ordnance, hazardous propellant, radiofrequency transmitter power, or other subsystem components in quantities or levels exceeding the EPC's in Table C-2 below?	☐	☒
2. Would the expected risk of human casualty from spacecraft planned orbital reentry exceed the criteria specified by NASA Standard 8719.14?	☐	☒
3. Would the candidate spacecraft utilize any potentially hazardous material as part of a flight system whose type or amount precludes acquisition of the necessary permits prior to its use or is not included within the definition of the Envelope Payload Characteristics?	☐	☒
4. Would the candidate mission, under nominal conditions, release material other than propulsion system exhaust or inert gases into the Earth's atmosphere or space?	☐	☒
5. Are there changes in the preparation, launch or operation of the candidate spacecraft from the standard practices described in Chapter 3 of this EA?	☐	☒
6. Would the candidate spacecraft utilize an Earth-pointing laser system that does not meet the requirements for safe operation (ANSI Z136.1-2007 and ANSI Z136.6-2005)?	☐	☒
7. Would the candidate spacecraft contain, by design (e.g., a scientific payload) pathogenic microorganisms (including bacteria, protozoa, and viruses) which can produce disease or toxins hazardous to human health or the environment beyond Biosafety Level 1 (BSL 1)[1]?	☐	☒
Comments:		

Continued on next page

[1]The use of biological agents on payloads is limited to materials with a safety rating of "Biosafety Level 1." This classification includes defined and characterized strains of viable microorganisms not known to consistently cause disease in healthy human adults. Personnel working with Biosafety Level 1 agents follow standard microbiological practices including the use of mechanical pipetting devices, no eating, drinking, or smoking in the laboratory, and required hand-washing after working with agents or leaving a lab where agents are stored. Personal protective equipment such as gloves and eye protection is also recommended when working with biological agents.

NASA Routine Payload Checklist (continuation)

Project Name: Joint Polar Satellite System (JPSS), JPSS-2 and JPSS Polar Follow Missions (JPSS-3 and JPSS-4), Flight Project		Date of Launch 07/21; 07/26, 07/31
Project Contact: Bryan A. Fafaul	Phone Number: 240-684-0602	Mailstop: 472
Project Start Date: Jul 2010	Project Location: GSFC, Greenbelt, MD	

Project Description:
The NASA GSFC Code 472 organization that manages the development, testing, launch and early orbit checkout of the JPSS satellites.

F. Other Environmental Issues:	Yes	No
1. Would the candidate spacecraft have the potential for substantial effects on the environment outside the United States?	☐	☒
2. Would launch and operation of the candidate spacecraft have the potential to create substantial public controversy related to environmental issues?	☐	☒
3. Would any aspect of the candidate spacecraft that is not addressed by the EPCs have the potential for substantial effects on the environment (i.e., previously unused materials, configurations or material not included in the checklist)?	☐	☒

Comments:

Table C-1. Launch Vehicles and Launch Sites

Launch Vehicle and Launch Vehicle Family	Space Launch Complexes and Pads				
	Eastern Range (CCAFS)	Western Range (VAFB)	USAKA/RTS	WFF	KLC
Athena I, IIc, III[a]	LC-46	CA Spaceport (SLC-8)	NA	Pad 0	LP-1[a]
Atlas V Family	LC-41	SLC-3	NA	NA	NA
Delta II Family	LC-17	SLC-2	NA	NA	NA
Delta IV Family	LC-37	SLC-6	NA	NA	NA
Falcon I/Ie	LC-36	SLC-4W	Omelek Island	Pad 0	LP-3[b]
Falcon 9	LC-40	SLC-4E	Omelek	Pad 0	LP-1
Minotaur I	LC-20 and/or LC-46	SLC-8	NA	Pad 0	LP-1
Minotaur II-III	LC-20 and/or LC-46	SLC-8	NA	Pad 0	LP-1
Minotaur IV[c]	LC-20 and/or LC-46	SLC-8	NA	Pad 0	LP-1
Minotaur V	LC-20 and/or LC-46	SLC-8	NA	Pad 0	NA
Pegasus XL	CCAFS skidstrip KSC SLF	VAFB Airfield	Kwajalein Island	WFF Airfield	NA
Taurus	LC-20 and/or LC-46	SLC-576E	NA	Pad 0	LP-1
Taurus II	NA	NA	NA	Pad 0	LP-3[b]
Any other launch vehicle/launch site combination for which NASA has completed or cooperated on the NEPA compliance.					

a
Athena III is currently under design.
b
LP-3 is currently under design.
c
While not explicitly listed in this table, the Minotaur IV includes all configurations of this launch vehicle, including the Minotaur IV+, which is a Minotaur IV with a Star 48V 4th stage.

Key: CA = California; CCAFS = Cape Canaveral Air Force Station; KSC = Kennedy Space Center; LC = Launch Complex; LP = Launch Pad; MARS = Mid-Atlantic Regional Spaceport; SLC = Space Launch Complex; SLF = Shuttle Landing Facility; USAKA/RTS = United States Army Kwajalein Atoll/Reagan Test Site; VAFB = Vandenberg Air Force Base; WFF = Wallops Flight Facility.

Table C-2. Summary of Envelope Payload Characteristics by Spacecraft Subsystems

Structure	• Unlimited: aluminum, beryllium, carbon resin composites, magnesium, titanium, and other materials unless specified as limited.
Propulsion[a]	• Liquid propellant(s); 3,200 kg (7,055 lb) combined hydrazine, monomethyhydrazine and/or nitrogen tetroxide. • Solid Rocket Motor (SRM) propellant; 3,000 kg (6,614 lb) Ammonium Perchlorate (AP)-based solid propellant (examples of SRM propellant that might be on a spacecraft are a Star-48 kick stage, descent engines, an extra-terrestrial ascent vehicle, etc.)
Communications	• Various 10-100 Watt (RF) transmitters
Power	• Unlimited Solar cells; 5 kilowatt-Hour (kW-hr) Nickel-Hydrogen (NiH_2) or Lithium ion (Li-ion) battery, 300 Ampere-hour (A-hr) Lithium-Thionyl Chloride (LiSOCl), or 150 A-hr Hydrogen, Nickel-Cadmium (NiCd), or Nickel-hydrogen (NiH_2) battery.
Science Instruments	• 10 kilowatt radar • American National Standards Institute safe lasers (see Section 4.1.2.1)
Other	• U. S. Department of Transportation (DoT) Class 1.4 Electro-Explosive Devices (EEDs) for mechanical systems deployment • Radioactive materials in quantities that produce an A2 mission multiple value of less than 10 • Propulsion system exhaust and inert gas venting • Sample returns are considered outside of the scope of this environmental assessment

a
Propellant limits are subject to range safety requirements.

Key: kg=kilograms; lb=pounds.

GSFC Flight Project Environmental Checklist

1. Project/Program	Date:
Joint Polar Satellite System (JPSS), JPSS-2 and JPSS Polar Follow Missions (JPSS-3 and JPSS-4), Flight Project	02/01/2016

2. Schedule

PDR/CDR:	Launch Date:
Flight J-2/3/4 SRR: 02/2016; MPDR J-2, J-3/4: 10/2016, 03/2018; MCDR JPSS-2, J-3/4: 06/2017, 11/2018	07/21; 07/26, 07/31

3. Current Status

The JPSS-2 satellite is currently in development. JPSS-3 and JPSS-4 satellites are options on the delivery order with awards anticipated prior to 2019. The JPSS-2, JPSS-3 and JPSS-4 instruments are in development. The Flight Project SRR was held February 2016. The JPSS instruments are repeat builds of the JPSS-1 instruments.

4. Project Description

a. Purpose:
The JPSS Mission objectives are to sustain continuity of and enhance NOAA's Earth observation analysis, forecasting and climate monitoring capabilities from global polar-orbiting observations. JPSS provides operational continuity of satellite-based observations and products for NOAA Polar-orbiting Operational Environmental Satellites (POES) and the Suomi National Polar Partnership (S-NPP) system.

b. Spacecraft:
The JPSS-2, -3, and -4 spacecraft are provided by Orbital ATK under contract NNG15VE05D. The bus is based on the heritage LeoStar3 and IceSat2 bus designs.

c. Instruments:
Includes "same" mandatory payload as SNPP, which are the ATMS (NGES), CrIS (Harris), OMPS (BAT), VIIRS (RSAS). Radiation Budget Instrument (RBI), provided by Exelis is the next generation instrument that replaces the heritage SNPP and JPSS-1 CERES. RBI is provided to JPSS by NASA's Earth Systemic Missions (ESM) Program

d. Launch Vehicle:
Launch Services (LS) provided by KSC Launch Services Program (LSP) and procured individually due to separation between the JPSS-2, JPSS-3 and JPSS-4 launch dates. JPSS-3/4 LS will be procured with follow-on contract vehicle to NLS-II (Delta-IV, Falcon-9, Atlas-V).

e. Launch Site:
Western Range, Vandenberg AFB

f. NASAs Involvement/Responsibility: (include other NASA Centers)
NASA is responsible for all Space Segment elements (spacecraft, instruments), Systems Engineering, contract management, mission integration, and launch vehicle

g. Participants/Locations:
Mission Management: GSFC (Greenbelt, MD), Spacecraft (Gilbert, Arizona), ATMS (Azusa, CA), CrIS (Ft Wayne, IN; Rochester, NY), OMPS (Boulder, CO), VIIRS (El Segundo, CA), RBI (Ft Wayne, IN), LV (KSC, FL), Launch Site (VAFB, CA)

h. End-of-Mission Plan: Planned Re-entry (controlled/uncontrolled?)
Controlled re-entry (no change from SNPP or JPSS-1)

5. Is there anything controversial or unique about the mission, spacecraft or instruments? If yes, Explain. Yes ☐ No ☒

6. Is the mission compliant with NASA requirements for limiting orbital debris (NPR 8715.6, and NASA Standard 8719.14? Explain non-compliances. Yes ☒ No ☐

Controlled re-entry (no change from SNPP or JPSS-1)
Launch Vehicle(s): Delta-IV, Falcon-9, or Atlas-V

7. During any phase, does the mission/project include or involve: Check yes for all that apply. If uncertain, check the corresponding box. For all that apply, provide an explanation	Yes	No	Uncertain
A. Fuels	☒	☐	☐
B. Ionizing Radiation Devices/Sources	☐	☒	☐
C. Explosives	☐	☒	☒
D. Hazardous Materials/Substances/Chemicals	☒	☐	☐
E. Lasers (Class, Earth Pointing)	☐	☒	☐
F. Disease Producing Pathogenic Microorganisms/Biological Agents	☐	☒	☐
G. Discharges/Venting of any Substances into Air, Water, or Soil	☐	☒	☐
H. Hazardous Waste Generation	☐	☒	☐
I. High Noise Levels	☐	☒	☐
J. Sample Return to Earth	☐	☒	☐
K. Radio Frequency Communications	☒	☐	☐
L. Construction/Modification/Demolition of a Facility/Lab (onsite - offsite)	☐	☒	☐
M. Land Disturbance, Tree Clearing, Removal of Vegetation	☐	☒	☐
N. Impact on Threatened or Endangered Species	☐	☒	☐
O. Impact/Destruction of Sensitive Wildlife Habitat	☐	☒	☐
P. Impact on Cultural Resources	☐	☒	☐
Q. Impact on Local Social or Economic Conditions (Increase in Traffic, Employment, etc.)	☐	☒	☐
R. Impact on Minority or Low Income Populations	☐	☒	☐
S. New or Foreign Launch Vehicle	☐	☒	☐
T. Other Issues of Potential Environmental Impact	☐	☒	☐
U. Environmental Permits	☐	☒	☐

Additional Information:
7A) Fuel: ~405kg of mono-propellant hydrazine
7D) Hazardous Materials: ~170 g of anhydrous ammonia and ~27 kg Beryllium
7K) RF Communications: X-band (qty 2), 17 dBw (EIRP); S-band (qty 2), 7 dBw (EIRP); Ka-band (qty 2), 56 dBw (EIRP)

8. What Safety Hazards are associated with the mission?

Crane lifts, RF radiation, launch, re-entry, battery reconditioning, and spacecraft fueling

9. Summary of Subsystem Components

Propulsion (Include fuel type, amount, tank size, materials, dimensions	Propulsion Subsystem (PSS) is a blow-down, hydrazine monopropellant propulsion system similar to that successfully used on our other spacecraft. Propulsion subsystem contains a single propellant tank 40.9 in OD x 41.7 in boss-to-boss Oblate Spheroid; Titanium.
Communications	X-band (qty 2), 17 dBw (EIRP); S-band (qty 2), 7 dBw (EIRP); Ka-band (qty 2), 56 dBw (EIRP)
Structural Materials	Aluminum frame w/ honeycomb panels
Power	4450 W EOL single wing deployable solar array; 8s2p 204Ahr Li-Ion Battery (qty 2)
Science Instruments	ATMS, CrIS, OMPS, VIIRS, RBI
Hazardous components (radioactive materials, lasers, chemicals, etc.)	(~170 g) Anhydrous Ammonia in spacecraft heat pipes; 23 kg Beryllium in CrIS, 2.5 kg Beryllium n ATMS, and 1 kg Beryllium in VIIRS
Other (include dimensions and weight of s/c)	H: 135" x Dia.: 52" Satellite Wet Mass: 2,680 kg

GSFC Flight Project Environmental Checklist

Project Manager Printed Name:	Signature Field		
Bryan A. Fafaul	Bryan A. Fafaul		
Project Name:	**Date:**	**Phone Number:**	**Org Code:**
JPSS Flight Project	7-15-16	240-684-0602	472

Comments:
JPSS-2, -3, and -4 include the "same" payload as SNPP, including the OMPS-Limb sensor. The Radiation Budget Instrument (RBI) is the next generation instrument that replaces the heritage SNPP and JPSS-1 CERES. RBI and OMPS-Limb are being provided to JPSS by NASA's Earth Systemic Missions (ESM) Program. JPSS-3 and JPSS-4 are identical to JPSS-2, including the same payloads. OMPS-Limb is included in the JPSS-3/4 instrument proposals, but dependent on funding. RBI has a Contract Line Item (CLIN) option for follow-on instruments for JPSS-3 and -4 per an IDIQ task. JPSS -2, -3, and -4 Missions are Category 1 per NPR 7120.5, High National Priority with Life Cycle Cost >$1B. The payload is a Class B Payload Risk Classification per NPR 8705.4, High National Significance, High Complexity, High Cost Mission Lifetime 2-5 Years. The Launch Vehicle is a Risk Category 2 per NPR 8610.7, Medium Risk, "launch vehicles that have demonstrated a limited history of successful flights". The Mission Design summary is that JPSS-2/3/4 Spacecraft are identical; JPSS-2/3/4 Payloads are identical; Mission Lifetime is 7 years; propellant budget for 10.5 years; Orbit: Sun Synchronous (824 km, LTAN 1330); Launching from the Western Test Range; and End of Mission plan is Controlled Reentry.

Launch Service procurement planning dates
J2 NET 2QCY2017
J3 NET 2QCY2020
J4 NET 2QCY2023