APPENDIX E

RESPONSES TO FEDERAL, STATE AND LOCAL GOVERNMENT ORGANIZATIONS

APPENDIX E

RESPONSES TO FEDERAL, STATE, AND LOCAL GOVERNMENT ORGANIZATIONS

The U.S. Environmental Protection Agency published a Notice of Availability for the Cassini mission Draft Environmental Impact Statement in the Federal Register on October 21, 1994. The public review and comment period closed on December 20, 1994. Timely comments were received from the Federal, state and local government organizations listed in Table E-1.

Where no extension of the comment period was requested and granted, untimely comments were still considered if received before March 3, 1995 (see Table E-2). As of March 3, 1995, one letter was received after the comment period closed, and is included in this Appendix.

This Appendix provides specific responses to the comments received from the Federal, state and local agencies listed in Tables E-1 and E-2. Copies of the comment letters are presented in the following pages. The relevant issues in each comment letter are marked and numbered for identification along with the National Aeronautics and Space Administration's (NASA's) response to each issue. Where changes in the text were appropriate, such changes were noted in the comment response.

The comments received from the Federal, state and local government organizations related to the following issues in the Environmental Impact Statement (EIS):

- environmental impacts on groundwater near the launch site
- cumulative environmental impacts on the stratospheric ozone
- clarification of radiological impacts analyses

Information on these topics is addressed in the following sections of the EIS:

<u>Groundwater impacts near the launch site</u> - The description of the groundwater in the Cape Canaveral Air Station/Kennedy Space Center regional area is presented in Sections 3.1.5.3 and 3.1.5.4. In addition, Sections 4.1.2.6 and 4.2.2 discuss the environmental impacts on the hydrology and water quality from a normal launch.

<u>Cumulative impacts on the atmospheric ozone</u> - The impacts on the upper atmosphere includes a discussion of the potential cumulative impacts on the ozone layer including those from other launches. The discussion is provided in Section 4.1.2.3 of the EIS.

<u>Radiological impact analyses</u> - Sections 4.1.5 through 4.1.8 and Sections 4.2.5 through 4.2.8 discuss the following: the methodologies used in the radiological assessments, radiological consequences, and risk analyses for the Cassini mission.

TABLE E-1. LIST OF COMMENTORS

Commentor	Date of	Organization	Individual Presenting
Number	Comment		Comments
1	11/7/94	Brevard County Planning and Zoning Division	Peggy Busacca
2	11/10/94	U.S. Dept. of Health and Human Services	
		Centers for Disease Control	Kenneth W. Holt
3	12/20/94	U.S. Environmental Protection Agency (EPA),	
		Office of Federal Activities	Richard E Sanderson

TABLE E-2. LIST OF COMMENTORS RESPONDING AFTER CLOSE OF PUBLIC COMMENT PERIOD

Commentor	Date of	Organization	Individual Presenting
Number	Comment		Comments
4	12/23/94	State of Florida, Dept. of Community Affairs	Linda Loomis Shelley



FLORIDA'S SPACE COAST Telephone: (407) 633-2069

SCOTT ELLIS

District 5

SANDY CRAWFORD Clerk

RESPONSES TO COMMENTS Commentor No. 1: Brevard County Planning and Zoning Division (Peggy Busacca)

PLANNING and ZONING DIVISION 2725 St. Johns St., Bldg. A, Viera, Florida 32940

November 7, 1994

Dr. Peter B. Ulrich Chief, Flight Programs Branch Solar System Exploration Division Office of Space Science Code SL NASA Headquarters Washington, DC 20546

Dear Dr. Ulrich:

- m Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS)
- $\dot{\omega}$ for the Cassini Mission. The Brevard County Planning and Zoning Division does not have any comments to make at this time regarding the above mentioned DEIS. However, the -1A Planning and Zoning Division staff would like to be informed regarding any changes or updates that may be made to the DEIS.

If you have any questions or need additional information, please contact Todd Corwin or me at (407) 633-2066.

Sincerely,

Kegoy Busacca Peggy Busacca, Director

Planning and Zoning Division

Dean Sprague, Assistant County Administrator cc: Gary Ridenour, Director, Growth Management Department Lisa Barr, Director, Natural Resources Management Division

TRUMAN SCARBOROUGH, JR	KAREN S. ANDREAS	NANCY HIGGS	SUE SCHMITT-KIRWAN
District 1	District 2	District 3	District 4
TOM N. JENKINS	SCOTT L KNOX		
County Administrator	County Attorney		
	PRINT	ED ON RECYCLED PAPER	

Response to Comment 1A:

Comment Noted. Thank You.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

RESPONSES TO COMMENTS

Commentor No. 2 : U.S. Dept. of Health & Human Services, Centers for Disease Control (Kenneth W. Holt)

Centers for Disease Control Atlanta GA 30341-3724

November 10, 1994

Dr. Peter B. Ulrich Chief, Flight Programs Branch Code SL NASA Headquarters Washington, D.C. 20546

Dear Dr. Ulrich:

We have completed our review of the Draft Environmental Impact Statement (DEIS) for the Cassini Mission, National Aeronautics and Space Administration. We are responding on behalf of the U.S. Public Health Service.

In general, this DEIS addresses the public health concerns associated with each alternative However, there are several suggested modifications offered by our reviewer that would improve the document. These comments are detailed in the attachment. If you should have any questions concerning these comments, you may contact Dr. Sanford Leffingwell at (404) 488-7091.

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Thank you for the opportunity to review and comment on this draft document. Please ensure that we are included on your mailing list to receive a copy of the Final EIS, and future EISs which may indicate potential public health impact and are developed under the National Environmental Policy Act.

Sincerely yours,

Remmett W. Holt

Kenneth W. Holt, M.S.E.H. Special Programs Group (F29) National Center for Environmental Health

Attachment

Comments on Draft Environmental Impact Statement for the Cassini Mission National Center for Environmental Health, Centers for Disease Control and Prevention

Page/
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Paragraph/	Comment	
Line	Comment	
viii/3/7-9	The statement "Considering the extremely low probability of such an inadvertent reentry, NASA has estimated that normal worldwide cancer fatality rates could increase by approximately 0.0005 percent if such an accident were to occur" seems internally contradictory. The phrase "Considering the extremely low probability of such an inadvertent reentry" suggests that the 0.0005% increase is the product of the expected consequence and the probability of its occurrence, while the phrase "if such an accident were to occur" suggests that the 0.0005% worldwide increase is the consequence, untempered by probability of occurrence (the more usual way of	- 2A
μ σ	presenting such considerations). This should be clarified. Further, there needs to be a justification for use of worldwide incidence as an appropriate statistic rather than local incidence nearest the point of impact. An increase from a background rate of around 20% to a rate of 100% in a sufficiently small population would have a negligible impact on world incidence rates but would be catastrophic for the population affected. Some information on the persistence of this elevation would also be helpfulwould it last forever? Finally, a term such as "background" might be better than "normal," since there is some controversy about how "normal" current cancer rates are.	- 2B - 2C - 2D
viii/4 ff	It might be helpful to include information about both the probability of occurrence and magnitude of consequence in the discussions of health effects risk.	2E
xxi-xxvii	This is a good location for the glossary of abbreviations and acronyms. Thanks.]- 2F
2-17	The table doesn't seem to balance. The weight percents at launch total to 97.89% and the total Bequerels at Launch for Pu-241 would appear to be 8.2×10^{13} , not 6.9×10^{13} . That should have no significant impact on the conclusions, but presence of a problem is often an indication of a need to review a section carefully, looking for errors which might be significant. (The published number for Pu-241 might even be correct for some reason inapparent to those of us uninitiated in the mysteries of nuclear physics.) In the table below, the first two columns were taken from Table 2-3; the third is the product of 10.8 kg and the percent-by-weight column; the fourth through sixth are taken from Table 2-3; the seventh and eighth are the product of column	- 20

RESPONSES TO COMMENTS Commentor No. 2: U.S. Dept. of Health & Human Services, Centers for Disease Control (Kenneth W. Holt) (Continued)

Response to Comment 2A:

The text on page viii has been clarified to note that if such an inadvertent reentry accident were to occur, the estimated numbers of resulting excess cancer fatalities would represent about 0.0005 percent of the normally observed cancer fatalities that would occur within the exposed population of about 5 billion people worldwide.

Response to Comment 2B:

Worldwide cancer incidence is an appropriate statistic to use when discussing potential exposures from a swingby accident since plutonium could be released in the upper atmosphere as vapor and/or small particulates. The vapor and/or particulates could then be transported and distributed worldwide by the wind circulation patterns in the upper atmosphere.

All releases could have local impacts. However, ground level releases resulting from accident scenarios in which plutonium-containing components of the radioisotope thermoelectric generators (RTGs) hit hard surfaces would be considered to have more of a local impact than a global (or worldwide) impact. Such ground-level releases would not be dispersed by upper atmospheric wind patterns. Localized low atmosphere or ground-level wind patterns would dominate the dispersal processes.

Tables C-5, C-6, and C-7 provide the fuel end states predicted for a plutonium release from an inadvertent reentry during an Earth swingby. The dominant contributor to the health effect impacts from both shallow and steep reentries would be from the vapor end state. The plutonium dioxide vapor and particulates are predicted to contribute about 99 percent of the estimated total health effects. Released at high altitude, the vapor/particulates would be transported and distributed worldwide by the wind circulation patterns in the upper atmosphere. Conversely, Tables C-5, C-6, and C-7 indicate a lesser health effect impact from ground level releases of plutonium dioxide, The health effect impact in the exposed population at risk from ground-level releases would be statistically indistinguishable from the normally observed cancer fatalities.

RESPONSES TO COMMENTS Commentor No. 2: U.S. Dept. of Health & Human Services Centers for Disease Control (Kenneth W. Holt) (Continued)

Response to Comment 2C:

The contamination resulting from an accident would not last "forever," The dominant isotope of the fuel, plutonium-238, has a half-life of 87.75 years. Because of radioactive decay and accounting for all the plutonium isotopes in the original fuel, the amount of plutonium remaining (without any mitigation actions) after 100 years would be 45 percent, after 500 years would be 2 percent, after 1 000 years 0. 13 percent, and after 5,000 years would be 0.08 percent.

Response to Comment 2D:

Comment noted. Text has been clarified where appropriate.

Response to Comment 2E:

Comment noted. The probability of occurrence and magnitude of the consequences are discussed in detail beginning with Sections 4.1.5 through 4.1.8 and Sections 4.2.5 through 4.2.8 of the Environmental Impact Statement (EIS). The executive summary provides a synopsis of the analysis and the results obtained.

Response to Comment 2F:

NASA appreciates your comment. Thank you.

Response to Comment 2G:

A revised table has been included in the EIS. Please note that the total inventory is unchanged.

RESPONSES TO COMMENTS

Commentor No. 2: U.S. Dept. of Health & Human Services Centers for Disease Control (Kenneth W, Holt) (Continued)

Paragraph/ Line Comment three and either column five or column six. Numbers below the line are 2-17 (cont'd) column sums. 7-2H This safety data is well-presented and impressive. 2-19 Does "to destruct" mean something different from "to destroy?" If so, 2-28/5 perhaps it should be explained if not, perhaps the plainer English form should - 21 (& elsewhere) he used (or utilized, if you must). The meaning of these numbers needs clearer explication Did the low number 2-64 & 65 of health effects (3.36×10^4) result from the fact that no one lives in the 0718 square miles nearest the pad or from the fact that there is little likelihood of injury even if someone did spend a significant fraction of there time in that area? If the expected number of excess cancers is 3.36×10^{-4} and the average - 2J risk is 3.1×10^{-12} , the risk is apparently being distributed over $3.36 \times 10^{-1/2}$ 3.1×10^{-12} or 1.8×10^8 people. Surely there are not 180,000,000 people living in the .0718 square miles, so that interpretation must be wrong What is the correct interpretation? Again, a rationale for averaging exposure over the whole earth rather than 2-66, footnote d some finite area near the point where containment failed (below, or even -2K limited to a latitude band) should be given. If exposure estimates have assumed a more local distribution, then the text and notes should explain more clearly what the assumptions were and perhaps give sample calculations. These paragraphs are very helpful is addressing some of the questions raised 4-101/2 & 3 earlier in the document. Adding a summarization of the calculations to the appropriate tables in section 2 would greatly facilitate reading, and similar - 2L inclusion in the text at an earlier point would also be useful. There are only 5 pages left in the document when this information is presented!

Page/

E-7

Response to Comment 2H:

Comment noted. Thank you.

Response to Comment 2I:

The correct verb is "destroy," "Destruct" is a common terminology employed by the aerospace community and denotes a human action undertaken to purposely destroy a vehicle, spacecraft, or other component.

Response to Comment 2J:

Table 2-7 indicates that the potential land area contaminated above the EPA screening level from a Phase 1 accident would be $1.86 \times 10^{-1} \text{ km}^2$ (7.18 x 10^{-2} Mi^2). The exposed population would not necessarily occupy the contaminated land area. The population exposures would occur largely as a result of airborne transport of released fuel dominated by local wind patterns. The estimated population at risk from a Phase 1 accident would be the population in the vicinity of CCAS, estimated to be 100,000 people.

Footnotes have been added to Tables 2-7 and 2-8 for clarification. The radiological consequences are presented for the phase/accident scenario combination with the largest contribution to the mission risk for the population in the indicated affected area. As shown in Tables 4-1 7 and 418, the total probability for a Phase 1/Titan IV (SRMU)/Centaur Fail-To-Ignite scenario would be 9.1 x 10^{-4} with an estimated 3.36 x 10^{-4} health effects. The product of these two numbers gives the mission risk contribution of 3.1 X 10^{-7} health effects. With an estimated population of 100,000 exposed to the release, the average individual risk would be 3.1 x 10^{-1}

Response to Comment 2K:

See response to Comment 2B. The estimated average individual risk is reported in Table 2-8, as well as in Table 4-18. Also estimated, and reported in Section 4.1.8 and Table 4-19, is the average individual risk that person within the reentry footprint could face if an inadvertent reentry accident occurred and the footprint was over land,

RESPONSES TO COMMENTS Commentor No, 2: U.S. Dept. of Health & Human Services Centers for Disease Control (Kenneth W. Holt) (Continued)

Response to Comment 2L:

Thank you. Footnotes have been added to Tables 2-7 and 2-8 for clarification.

10.8 kg = Total Weight of fuel			Specific Radioactivity		Total Radioactivity		
Ũ		Weight	Half-	(Bequerel	(Curies/	at Lau	nch
Element	% by Wt.	kg L	ife /gram) gra	m) Bequ	erels Curies	<u>s</u>
Pu-236	2.5E-6	0.0000	2.851	2.0E+13	531.3	5.40E+09	0.14
Pu-238	70.81	7.6475	87.75	6.3E+11	17 .1	4.82E+15	130,771.91
Pu-239	12.86	1.3889	24,131	2.3E+09	0.062	3.19E+12	86.11
Pu-240	1.79	0.1933	6,569	8.4E+09	0.2267	1.62E+12	43.83
Pu-241	0.20	0.0216	14.4	3.8E+12	103	8.21E+13	2,224.80
Pu-242	0.11	0.0119	375,800	1.5E+08	0.00393	1.78E+09	0.05
Other	0.25	0.0270					
$(0-16)_{-10}$	11.85	1.2798					
	97.87	10.5700				4.90E+15	133,126.83

RESPONSES TO COMMENTS Commentor No. 2: U.S. Dept. of Health & Human Services, Centers for Disease Control (Kenneth W. Holt) (Continued)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

17E0 2.3 SP1

OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE

Dr. Peter Ulrich Solar System Exploration Division Office of Space Science NASA Headquarters Washington, DC 20546

Dear Dr. Ulrich:

-10

The Environmental Protection Agency (EPA) has reviewed the National Aeronautics and Space Administration (NASA) draft environmental impact statement (EIS) for the Cassini Mission. This review was conducted in accordance with our responsibilities under section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA). We have classified this draft EIS as EC-2 (environmental concerns, insufficient information).

This rating primarily reflects our concerns for cumulative impacts. Under section 1508.7 of the Council on Environmental Quality (CEQ) NEPA Implementing Regulations, NASA is required to examine:

...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (Emphasis added)

As EPA has commented before, we believe that cumulative impacts to the ozone layer from all launch activities need to be thoroughly examined in the near future. While any singular launch may have little impact, we do not know what the cumulative impacts to the stratosphere may be.

EPA also would like to see effects of launch activities such as deluge, noise, fire suppression and washdown waters more thoroughly examined in the final EIS. While no data are presented in the document, EPA suspects that the groundwater in the vicinity of the three receiving percolation ponds is contaminated from runoff from this and other launches.



3A

- 3B

RESPONSES TO COMMENTS Commentor No 3: U.S. Environmental Protection Agency (EPA) Office of Federal Activities (Richard E. Sanderson)

Response to Comment 3A:

Additional text has been added to Section 4.1.2.3 of the Environmental Impact Statement (EIS) to reflect the current state-of-the-science of the cumulative impacts on ozone due to rocket launches.

Response to Comment 3B:

Deluge, noise, fire suppressant and washdown water present after launch activities are temporarily held in the flame bucket, This water is released to the percolation ponds only when analytical results indicate that it satisfies permit criteria (State of Florida drinking water standards). Therefore, the release of this water should not adversely impact the groundwater system to any significant degree. Updated data from the U.S. Air Force groundwater monitoring wells at the Titan IV Launch Complexes 40 and 41 have been obtained and are included in Tables 3-3 and 3-4 of the EIS with updated text presented in Section 4.1.2.6.

In addition to our comments on the cumulative impacts associated with this and other launches, EPA has two other comments. First, the tracking of hazardous materials associated with the industrial type activities attendant to launches continues to pose administrative difficulties for both the regulatory and regulated agencies. Because of the many potential generators engaged in this effort, EPA suggests you consider the development of a pharmacy-style hazardous materials acquisition system similar to that at nearby Patrick Air Force Base.

Secondly, the draft EIS states on page 3-13 that the Clean Air Act General Conformity Rules only apply to non-attainment areas. This is incorrect. The rules also apply to maintenance areas. While these rules may not be applicable to this project, EPA would like to correct this misinterpretation of the rules.

Thank you for the opportunity to review and comment on the draft EIS. If you have any questions please call me at (202) 260-5053 or Pat Haman at 260-3358.

Sincerely

Richard E. Sanderson Difector Office of Federal Activities

RESPONSES TO COMMENTS Commentor No. 3: U.S. Environmental Protection Agency (EPA) Office of Federal Activities (Richard E. Sanderson) (Continued)

Response to Comment 3C:

NASA has and will continue to consider use of a pharmacy-style system on a Centerby-Center basis. Please note that Cape Canaveral Air Station is managed by Patrick Air Force Base and is a U.S. Air Force facility.

Response to Comment 3D:

Section 3.1.2.3 of the EIS has been modified to reflect corrections associated with the Clean Air Act (CAA) General Conformity Rules.



RESPONSES TO COMMENTS Commentor No. 4: State of Florida, Dept. of Community Affairs (Linda Loomis Shelley)

STATE OF FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS

2740 CENTERVIEW DRIVE • TALLAHASSEE, FLORIDA 32399-2100

LAWTON CHILES Decer

December 23, 1994

LINDA LOOMIS SHELLEY Secretary

4A

Dr. Peter Ulrich Chief, Flight Programs Branch Solar System Exploration Division Office of Space Science Code SL NASA Headquarters Washington, DC 20546

RE: National Aeronautics and Space Administration - Draft Environmental Impact Statement - Cassini Mission -Kennedy Space Center, Brevard County, Florida SAI: FL9410171068C

Dear Dr. Ulrich:

E-12

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 93-194, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

Based on the enclosed comments provided by our reviewing agencies, the state has determined that the above-referenced project is consistent with the Florida Coastal Management Program.

Very truly yours, Linda Loomis Shelley Secretary

LLS/rk

Enclosures

EMERGENCY MANAGEMENT + HOUSING AND COMMUNITY DEVELOPMENT + RESOURCE PLANNING AND MANAGEMENT

Response to Comment 4A:

Comment noted. Thank you.

			DATE: 10/31/94
COUN	TY:BREVARD		COMMENT DUE DATE: 11/14/94
	STATE AGENCIES	LOCAL/OTHER	SALE: FL9410171068C OPB POLICY UNITS
	Agriculture		Public Safety
-	Board of Regents		Education
-	Commerce	SPWMD SWEWND	Environment/C & ED
	Community Affairs	SIRWIND	General Government
-	Education	SSRITIND	Health & Human Srv
×	Environmental Protection	SRWMD	Revenue & Eco. Ana
x	Game & Fish Comm	-	SCH
	Health & Rehab Srv	-	_x_ sch/con
	Highway Safety	L	
_	Labor & Employmnt		
	Law Enforcement		
X	Marine Fish Comm	Roy William	2
	State Library	MARINE FIS	COMMISSION
_	State		
_	Transportation	INTERDEPA	RTMENTAL
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L			NOV 1 4 1994
The attache Coastal Ma as one of ti	ed document requires a Coastal Zone M Inagement Program consistency evaluation following:	Aanagement Act/Florida ation and is categorized	Florida Constant Managemetica (Constant)
	Federal Assistance to State or Local G Agencies are required to evaluate the	overnment (15 CFR 930, Subpart F). consistency of the activity.	RECEIVEN
x	Direct Federal Activity (15 CFR 930, Su required to furnish a consistency dete concurrence or objection.	ibpart C). Federal Agencies are mination for the State's	HEVEIVED
	Outer Continental Shelf Exploration, D Activities (15 CFR 930, Subpart E). Op consistency certification for state con	evelopment or Production serators are required to provide a currence/objection.	NOV 0 3 1994
	Federal Licensing or Permitting Activi	ty (15 CFR 930, Subpart D). Such	MARINE FISHERIES
	projects will only be evaluated for con	sistency when there is not an	COMMISSION
	analogous state license or permit.		
FOR	CONSISTENCY PROJECTS	, SEE REVERSE SIDE FOR INST	RUCTIONS.
To:	State Clearinghouse	EO. 12372/NEPA	Federal Consistency
	Room 1603 The Capitol	or -OPB	
	Tallahassee, FL, 32399-0001	🗌 No Comment	No Comment/Consistent
	(904) 488-8114 (SC 278-8114) Comments Attache	d Consistent/Comments Attached
	Elorida Coastal Management	Director Not Applicable	Inconsistent/Comments Attached
	Department of Community Affa	irs	Not Applicable
	Suite 305, Rhyne Building		
	Tallahassee, FL. 32399-2100		
	(904) 922-5438 (SC 292-5438	») 	
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	Date:/ 1(- 0	2-9×	

RESPONSES TO COMMENTS Commentor No. 4: State of Florida, Dept. of Community Affairs (Linda Loomis Shelley) (Continued)



RESPONSES TO COMMENTS Commentor No. 4: State of Florida, Dept. of Community Affairs (Linda Loomis Shelley) (Continued)

Executive Summary

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Chapter 8