Public comments on NASA’s draft EIS for a Mars sample return, and what’s next

### [Public comments on the EIS show that many members of the public have similar views to Carl Sagan that this is a qualitatively different situation from a human pathogen in a BSL-4 and that NASA shouldn’t take even a low level of risk with Earth’s biosphere](#h_public_comments_on)[Next section](#h_EPAs_letter)

The public comments aren’t a poll, but they do show that many members of the public have similar views to Carl Sagan, Gill Levin, Carl Woese and others, that this is a qualitatively different situation from a known pathogen in a BSL-4 lab and that we shouldn’t take even a low level of risk.

Many specifically mention potential for unprecedented harm in one way or another. I think it is also reasonable to assume that all or nearly all the ones that say, test first, sterilize first or stop mission would support Carl Sagan’s quote [(Sagan, 1973)](#kix.urfjjsuep509):

***“The likelihood that such pathogens exist is probably small, but we cannot take even a small risk with a billion lives.”***

Here are the comments summarized, and I’ve shown in bold the ones that likely support Carl Sagan’s statement that we can’t take even a small risk with a billion lives.

As a rough estimate, 50 supporting some variation on Carl Sagan’s view out of a total of 63 separate people commenting (selected one only for duplicate entries). Some were anonymous and it’s not possible to know for sure if some of those were also duplicate. At any rate, several dozen distinct members of the public expressed views that suggest they would be in support of Sagan’s quote, on a not very widely publicised EIS.

* [**stop mission, unprecedented harm**](https://www.regulations.gov/comment/NASA-2022-0002-0177) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0178) **–** **[protect Earth](https://www.regulations.gov/comment/NASA-2022-0002-0179)** **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0180)**–** [**stop mission**](https://www.regulations.gov/comment/NASA-2022-0002-0181)
* [**stop mission**](https://www.regulations.gov/comment/NASA-2022-0002-0182) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0184) **–** [**test first, unprecedented harm**](https://www.regulations.gov/comment/NASA-2022-0002-0183) **–** [**keep Earth 100% safe**](https://www.regulations.gov/comment/NASA-2022-0002-0186) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0188)

* **[stop mission](https://www.regulations.gov/comment/NASA-2022-0002-0190)** – [need clarity about security measures](https://www.regulations.gov/comment/NASA-2022-0002-0187) – [off topic](https://www.regulations.gov/comment/NASA-2022-0002-0191) – [alternative design](https://www.regulations.gov/comment/NASA-2022-0002-0192) - [**keep Earth 100% safe**](https://www.regulations.gov/comment/NASA-2022-0002-0189)
* [**unprecedented harm**](https://www.regulations.gov/comment/NASA-2022-0002-0194) **–** **[stop mission, unprecedented harm](https://www.regulations.gov/comment/NASA-2022-0002-0193)** – [alternative design](https://www.regulations.gov/comment/NASA-2022-0002-0196) – [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0202) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0207)
* [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0203) **–** [**unprecedented harm**](https://www.regulations.gov/comment/NASA-2022-0002-0206) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0204) **–** [**Test first**](https://www.regulations.gov/comment/NASA-2022-0002-0197) **–** [**Don’t return unless 100% safe – or sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0210)
* [**Don’t return**](https://www.regulations.gov/comment/NASA-2022-0002-0199) **–** [**don’t return until 100% safe**](https://www.regulations.gov/comment/NASA-2022-0002-0205) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0208) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0209) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0198)
* [**ISS first**](https://www.regulations.gov/comment/NASA-2022-0002-0200) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0201) **–** [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0213) **–** [**unknown risk, test first**](https://www.regulations.gov/comment/NASA-2022-0002-0214) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0218)
* [extra precautions for EES reentry](https://www.regulations.gov/comment/NASA-2022-0002-0215) - [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0216) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0217) **–** [**sterilize in space station first**](https://www.regulations.gov/comment/NASA-2022-0002-0222) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0220)

* [**do not return**](https://www.regulations.gov/comment/NASA-2022-0002-0221) **–** [**do not return**](https://www.regulations.gov/comment/NASA-2022-0002-0223) **–** [**do not return**](https://www.regulations.gov/comment/NASA-2022-0002-0219) – [send to Russia first](https://www.regulations.gov/comment/NASA-2022-0002-0226) **–** [issues with disinfection of earth entry site](https://www.regulations.gov/comment/NASA-2022-0002-0230)
* [**test first**](https://www.regulations.gov/comment/NASA-2022-0002-0229) **–** [support EIS](https://www.regulations.gov/comment/NASA-2022-0002-0231) **–** [**study in situ or space lab or sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0232) – [fully support, suggests more samples](https://www.regulations.gov/comment/NASA-2022-0002-0234) – [– [off topic (future missions need to be designed for reeuse)](https://www.regulations.gov/comment/NASA-2022-0002-0233)](https://www.regulations.gov/comment/NASA-2022-0002-0233)

* [multiple cautious measures](https://www.regulations.gov/comment/NASA-2022-0002-0236) – [support EIS](https://www.regulations.gov/comment/NASA-2022-0002-0240) – [support EIS](https://www.regulations.gov/comment/NASA-2022-0002-0241) **–** [**test or sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0251) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0246)
* [**test in situ or don’t return**](https://www.regulations.gov/comment/NASA-2022-0002-0248) **–** [**do**](https://www.regulations.gov/comment/NASA-2022-0002-0247) **not return –** [**unprecedented harm, test first**](https://www.regulations.gov/comment/NASA-2022-0002-0243) **–** [**unprecedented harm, return to space station**](https://www.regulations.gov/comment/NASA-2022-0002-0252)
* - and the four comments already mentioned by name [**(Walker, 2022a)**](#b_Walker_2022) **([Dehel, 2022](#b_Dehel_2022))** [**(DiGregorio, 2022)**](#b_DiGregorio_2022) **([Everline, 2022](#b_everline_2022))**

Also notice that 12 said sterilize first, even though it’s not listed as an alternative action in the EIS.

* [**Don’t return unless 100% safe – or sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0210) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0218) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0216) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0217) **–** [**sterilize in space station first**](https://www.regulations.gov/comment/NASA-2022-0002-0222)
* [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0220) **–** [**test or sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0251) **–** [**sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0246) **–** [**study in situ or space lab or sterilize first**](https://www.regulations.gov/comment/NASA-2022-0002-0232)
* Plus [(Walker, 2022a)](#b_Walker_2022) ([Dehel, 2022](#b_Dehel_2022)) [(DiGregorio, 2022)](#b_DiGregorio_2022)

### [EPA’s letter posted on the last day of public discussion says they didn’t identify significant environmental concerns in their review of the EIS – with no mention of all the public comments raising concerns similar to Carl Sagan’s](#h_EPAs_letter)[Next section](#h_this_doesnt_look) – [previous section](#h_public_comments_on)

EPA posted on the last day of public comments. Their letter says it didn’t identify significant environmental concerns in its review of the EIS. It doesn’t say anything about a need for NASA to respond to new issues raised in the comments by the general public mentioned in the previous section [(EPA, 2022)](#B_epa_2022):

*We appreciate NASA addressing EPA’s concerns regarding water resources, unplanned releases and cultural/biological resources identified in the letter.*

*Based on the review of the draft PEIS, EPA did not identify significant environmental concerns to be addressed in the Final EIS.*

If Carl Sagan was still alive today he would surely have commented on the EIS raising the same concerns as many of the general public made.

### [This doesn’t look like the broad acceptance which Rummel et al said is essential for success of this mission – if NASA continues with this action, it is vulnerable to being stopped in the future](#h_this_doesnt_look)[previous section](#h_EPAs_letter)

Rummel at al wrote [(Rummel et al, 2002:96)](#B_rUMMEL_et_al_2002) :

*“Broad acceptance at both lay public and scientific levels is essential to the overall success of this research effort.”*

This doesn’t look like broad acceptance of NASA’s proposed action. It may be stopped at various points.

First NASA could withdraw the EIS, do the size limit review, do a scientifically rigorous EIS.

This seems far the best outcome for NASA. Not forced to do anything by a court decision. Not responding to public panic. They can decide in their own time how to proceed. For instance they can do a 100% safe mission using sterilize first, or they can work on other ideas, but it’s all done in coordination with the general public, legal experts, ethicists, social scientists etc.

Even a last minute conversion to a 100% safe mission could cause problems if NASA do it in response to panic from a distrustful public. Far better to get the public involved from the outset.

Assuming NASA continue with the EIS, it could be stopped by other agencies but this is unlikely as the draft EIS says that there are no significant environmental effects, so they’d have no reason to look at it closely.

The next point it can be stopped is by a court case. There is no provision for this within NEPA, so it is done through judicial review, usually on the basis that: ([Congressional Research Service, 2021](#b_CRS_2021)).

* the agency failed to consider some of the impacts
* the agency failed to properly consider the weight of the impacts under review

They can only be taken to the courts by someone with “standing”. For this, they need to take part in the public comments or debate in the NEPA process, and need to be directly affected by the proposed action.

There you have to show that you are particularly affected by it, which is normally understood to mean more so than by others. If the petitioner claims NASA overlooked a worst case risk of global effects NASA could try to block it on the basis that in their hypothetical scenario they wouldn’t be affected more than anyone else in the world and so don’t have standing.

In the past, environmental cases have gone either way based on subtle legal arguments about whether environmental effects give the petitioner “standing” for the case ([Birnbach, 1997](#b_Birnbach_1997)).

If it does get as far as the courts, the case is usually ([Congressional Research Service, 2021](#b_CRS_2021))

* referred back to the agency (such as NASA) for further proceedings HOWEVER
* the court can order the agency to stop the project going ahead or issue some other action (in this case perhaps order to sterilize the samples first?).

So if a case is taken out and it’s successful, that could lead to a justice asking NASA to either stop the mission or to sterilize the samples first.

If nobody takes them to court or NASA successfully block the case, the next step is the presidential directive NSC-25, which requires a review of large scale effects that could be reasonably expected to result in allegations of major or protracted effects. It has to be done even if the agency feels confident such allegations are false [(Whitehouse, 1977):](#b_WhiteHouse_1977). This happens after the NEPA process is completed [(Race, 1996)](#kix.7grd10futt6o).

If it gets past all those hurdles with little public awareness, it could be stopped at the last minute with samples already on their way back to Earth.

Mounting global public concern could lead to Congress and the president acting to tell NASA to divert the mission away from Earth. A worst case here might be an infodemic about Mars life similar to the COVID infodemic, junk science, problems for NASA’s credibility, and issues with eventual return of even 100% safe sterilized samples.

# References

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* [Comment posted May 4th](https://www.regulations.gov/comment/NASA-2022-0002-0058)
* [Comment posted December 13th](https://www.regulations.gov/comment/NASA-2022-0002-0237)

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* [Comment posted April 28th](https://www.regulations.gov/comment/NASA-2022-0002-0005)
* [Comment posted May 7th](https://www.regulations.gov/comment/NASA-2022-0002-0173) [with attachment with detailed proposal]
* [Comment posted December 5th](https://www.regulations.gov/comment/NASA-2022-0002-0227)

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Walker, R., 2022a, [Comment posted on May 15th by Robert Walker to NASA’s first request for comments on their plans](https://www.regulations.gov/comment/NASA-2022-0002-0170).

Later updated with:

* [Comment posted on November 28h by Robert Walker to NASA’s second request for comments on their draft EIS.](https://www.regulations.gov/comment/NASA-2022-0002-0195)
* [Comment posted December 5](https://www.regulations.gov/comment/NASA-2022-0002-0228)[th](https://www.regulations.gov/comment/NASA-2022-0002-0228)
* [Comment posted December 13th](https://www.regulations.gov/comment/NASA-2022-0002-0238)
* [Comment posted December 20th](https://www.regulations.gov/comment/NASA-2022-0002-0254)

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Whitehouse, 1977, [NSC-25: Scientific or Technological EXperiments with Possible Large-Scale Adverse Environmental Effects and Launch of Nuclear Systems into Space](https://irp.fas.org/offdocs/pd/pd25.pdf)