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## **Comments on the Draft Program Environmental Impact Report for the Santa Susana Field Laboratory, Ventura County, California**

### **Introduction**

The subject “Draft Program Environmental Impact Report for the Santa Susana Field Laboratory” (DEIR) is voluminous. It contains detailed information relating to the environmental impacts of the remediation of the Santa Susana Field Laboratory (SSFL). However, it is grossly deficient in three key areas, rendering it inadequate for its intended purpose to inform stakeholders and decisionmakers regarding appropriate remediation decisions. Consequently, substantial changes are needed in the document, as well as the relevant Consent Orders between DTSC and the responsible parties, Boeing, DOE, and NASA.

The three key deficient areas are:

1. Conflicting Project Objectives and Purpose
2. Incomplete Conclusions
3. Incorrect Evaluation of Purported Radiological Contamination and the Consequences Thereof

### **1. Conflicting Project Objectives and Purpose**

In Section 1.3.2 of the PEIR “Project Objectives,” DTSC states “The primary objective of the proposed project is to implement the 2007 Consent Order and the 2010 AOCs at SSFL.” For clarification, the 2007 Consent Order with the three responsible parties covers the soil of the entire site and the ground water, while the 2010 AOCs only address the soil in the DOE and NASA areas.

In Section 1.3.3, “Description of the Proposed Project” DTSC states “The purpose of the overall site cleanup and initial activities is to remove contamination from soil and groundwater to safeguard human health and environmental quality.....” In Section 3.6, “Overall Site Cleanup,” DTSC states “The purpose of the project is to remove contamination from soil and groundwater to safeguard human health and environmental quality, including by cleaning up the land and improving the quality of surface waters, groundwater, and downstream receiving waters.” Similar statements are made throughout the document.

The conflict arises when it is shown in the PEIR and other documentation in the possession of DTSC that the implementation of the 2010 AOCs actually degrades human health and

environmental quality and leads to substantial environmental impacts. While the 2007 Consent Order was risk-based, and consistent with all remediation performed in the United States and abroad, inspection of the 2010 AOCs reveals that they do not consider either the risks to be reduced by their implementation or the environmental and health impacts of their implementation. The justification for the 2010 AOCs, as stated by their activist and elected proponents, was to achieve the “maximum, or full” cleanup in order to protect the health of neighboring communities from contaminants emanating from SSFL. However, no governmental agency or cancer registry has ever found evidence of offsite health effects resulting from SSFL operations or residual contamination. On the contrary, DTSC has publically documented the lack of off-site health risk in Dayton Canyon, Runkle Canyon, Bell Canyon, and the Brandeis Bardin Campus of American Jewish University, all of which abut SSFL.

While some claim that the 2010 AOCs represent a cleanup to background scenario, they actually require cleanup to background or *detect*, resulting in the removal of hundreds of chemicals and radionuclides that pose no risk whatsoever. Because the prescriptions of the 2010 AOCs were imposed before the site was fully characterized, it should be no surprise that the environmental and health impacts of the 2010 AOCs are more severe than effects from the contaminants they are supposed to address. The undeniable reason for this is that there are no established pathways, except those that will be created by the proposed remediation.

## **2. Incomplete Conclusions**

As shown in Table 1.8 “Summary of Environmental Impacts and Mitigation Measures,” the DEIR correctly evaluates numerous environmental impacts to be “significant” even after mitigation, but erroneously claims that they are unavoidable. DTSC refuses to acknowledge the fact that most, if not all, of these significant environmental effects are a direct result of the requirements of the 2010 AOCs. In addition to the extremely low remediation criteria of the lookup tables (LUT), there are the effects of arbitrary requirements such as the prohibition of “area averaging,” “leave in place,” and onsite burial and land-filling of contaminated soil/sediments, regardless of their negative impacts on human health and environmental quality. Significant detailed information has already been provided to DTSC by the responsible parties showing that substantial mitigation of the environmental effects from soil excavation and hauling could be achieved simply by the expedient of using risk-based criteria instead of the arbitrary criteria of the 2010 AOCs.

The potential for substantial reductions in quantities of soil to be excavated, transported, and backfilled can be seen from the PEIS Table 1-4. It should also be noted that while the PEIR addresses the risks from releases of waste from truck accidents, it neglects the direct risks of injury and death from the same accidents as well as the excavation activities.

**TABLE 1-4**  
**ESTIMATED VOLUMES OF SOIL WASTE TYPES**

Soil Waste Type	NASA		DOE		Boeing		Total	
	Soil (CY)	Trucks <sup>B</sup>	Soil (CY)	Trucks <sup>B</sup>	Soil (CY)	Trucks <sup>B</sup>	Soil (CY)	Trucks <sup>B</sup>
Nonhazardous <sup>A</sup>	148,000	9,650	1,123,000	73,260	310,000	20,220	1,581,000	103,130
Hazardous <sup>A</sup>	696,000	45,400	49,000	3,200	63,000	4,110	808,000	52,710
Soil exceeding Presumptive Rad LUT <sup>A</sup>	26,000	1,700	91,000	5,940	0	0	117,000	7,640
Radiological/Mixed <sup>A</sup>					17,000	1,110	17,000	1,110
<b>Total</b>	<b>870,000</b>	<b>56,750</b>	<b>1,263,000<sup>C</sup></b>	<b>82,400</b>	<b>390,000</b>	<b>25,440</b>	<b>2,523,000</b>	<b>164,590</b>

Sixty percent of the soil waste is already characterized by DTSC as nonhazardous. The Hazardous waste and soils exceeding Rad LUT from NASA and DOE areas, as well as the Radiological/Mixed waste from the Boeing area are for the most part only slightly above artificially low background levels and well below risk levels. These all can be substantially reduced by a well designed risk-based cleanup. The environmental impacts correlate directly with the quantities of soil that is excavated and transported.

In 2008, Boeing prepared a draft “SENATE BILL 990 IMPLEMENTATION TECHNICAL MEMORANDUM,” which compared the environmental effects of three SB 990 scenarios: 10<sup>-4</sup> Suburban Residential, 10<sup>-6</sup> Rural Residential, and 10<sup>-4</sup> Suburban Residential with agricultural pathways and area averaging. These showed a range of 720,000 to 180,000 cubic yards of soil excavation with commensurate levels of emissions and fuel consumption. It must be remembered that SB 990 was enacted in an attempt to force Boeing into a cleanup that was equivalent to the eventual 2010 AOCs. SB 990 was declared unconstitutional after a successful challenge by Boeing.

In 2013, NASA was forced to exclude non-AOC alternatives from its Draft Environmental Impact Statement (DEIS), and its 2014 Final EIS was issued with only minor changes. Some of the changes resulted from an EPA review of the DEIS, which among other things, stated:

“We are concerned about the impacts associated with NASA's **proposed removal, transport, and disposal of the large volume of soil that is chemically contaminated at levels below risk-based thresholds**. At other cleanup sites, including adjacent non-federal portions of the Santa Susana site, nearly two-thirds of the soil with comparable levels of chemical contamination would be left in place. The increase in traffic and associated air emissions that would result from this action would create an unnecessary added burden to communities with environmental justice concerns near the potential receiving facilities, such as Kettleman City and Buttonwillow, as well as to the local community at the cleanup site. Based on the information provided in the Draft EIS, NASA proposed soil removal would require 52,000 (one-way) truck trips, compared to the 19,000 truck trips that would be required for cleanup to residential standards. As the Draft EIS also notes, this would be in addition to the 40,000 truck trips that Boeing and

the Department of Energy will need to haul waste to disposal facilities from their portions of the Santa Susana site.

Additionally, the total volume of soil would consume a notable portion of the hazardous waste landfill capacity in the State of California. DTSC has announced a commitment to reduce by half the amount of hazardous waste disposed in the State by the year 2025, and EPA supports that effort.”

In 2014, NASA issued a White Paper entitled, “Comparative Analysis of Background versus Risk-based Cleanup Scenarios for the Soils at Santa Susana Field Laboratory, Ventura County, California.” Their analysis showed the AOC cleanup would affect 102 acres with 500,000 cubic yards of soil removal, as contrasted with a risk-based cleanup that would affect only 18 acres with a soil removal of 182,000 cubic yards.

NASA also concluded:

“On the basis of the comparison of LUT values to low-effect levels, the background cleanup scenario is 1.2 to 200,000 times more conservative than necessary to protect ecological receptors for each of the 59 chemicals. For the five analytes identified as potentially requiring cleanup under a risk-based scenario, the background scenario is 1.2 to 5.5 times more conservative”

and

”Additionally, the background scenario requires cleanup of 59 chemicals. Of these 59 chemicals, 54 chemicals were not identified as posing significant risk to ecological receptors either because they are located at depths deeper than 6 ft bgs (deeper than ecological receptors would be exposed) or because the risk evaluation indicated that risk was low to negligible. Consequently, large areas of habitat that do not contain contaminants at concentrations known to pose risk to ecological receptors will be dug up and destroyed under the background cleanup scenario.”

In 2017 DOE presented its *Draft Environmental Impact Statement for Remediation of Area IV and the Northern Buffer Zone of the Santa Susana Field Laboratory* (DEIS), which, as required by NEPA, evaluated reasonable alternatives for the cleanup. In addition to the No Action Alternatives, DOE examined three Soil Remediation alternatives including the AOC LUT alternative, one Building Demolition alternative, and two Groundwater Remediation alternatives. These results are summarized in the following table from the DEIS.

Action Alternative Combination	Designation
Cleanup to AOC LUT Values + Building Removal + Groundwater Monitored Natural Attenuation	-
Cleanup to AOC LUT Values + Building Removal + Groundwater Treatment	Action Alternative Combination with the Largest Environmental Consequences (High Impact Combination)
Cleanup to Revised LUT Values + Building Removal + Groundwater Monitored Natural Attenuation	-
Cleanup to Revised LUT Values + Building Removal + Groundwater Treatment	-
Conservation of Natural Resources + Building Removal + Groundwater Monitored Natural Attenuation	Action Alternative Combination with the Smallest Environmental Consequences (Low Impact Combination)
Conservation of Natural Resources + Building Removal + Groundwater Treatment	-

AOC = Administrative Order on Consent for Remedial Action; LUT = Look-Up Table.

### Alternatives Evaluated in DOE DEIS

The Action Alternatives were also combined into one with the highest environmental impact and one with the lowest environmental impact. The amount of land disturbance, which is an indicator of the volume of soil that would be removed and the potential impacts on biological resources, air, traffic, and water use, would be about 130 acres under the Cleanup to AOC LUT Values Alternative; 40 acres under the Cleanup to Revised LUT Values Alternative and 32 acres under the Conservation of Natural Resources Alternative.

Additionally, DOE determined that under the No Action Alternative, the risk to a hypothetical onsite suburban resident from chemicals and/or radionuclides in Area IV and the NBZ is comparable to or less than the risk determined for background soil. Because there is little difference between those risks, there would also be little difference between the risks following cleanup under any of the soil remediation alternatives—risks in all cases would be close to those from exposure to background soil.

The DOE conclusions were reaffirmed by DTSC in their Appendix G Human Health. DTSC states in Section G.6 Summary of the No Action Alternative Soil Evaluation:

“The incremental impact assessment calculations for the hypothetical onsite suburban resident and recreational user exposures indicate the following:

- Onsite suburban resident direct pathways
  - There is a low probability of adverse health effects associated with potential onsite exposure to Area IV and NBZ process-related sources.
- Onsite recreational user
  - There is a low probability of adverse health effects associated with potential onsite exposure to Area IV and NBZ process-related sources.”

It is abundantly clear that there are remediation alternatives to the 2010 AOCs that would mitigate or possibly completely avoid the significant environmental impacts of a cleanup conforming to the 2010 AOC requirements. It is also abundantly clear, as it has been from the drafting of the 2010 AOCs, that DTSC places more importance on the AOCs than on protecting human health and environmental quality. Until this PEIR, DTSC has consistently refused to even talk about risk-based cleanups for the NASA and DOE areas and tried via SB 990 to impose similar requirements on Boeing. Because DTSC was a co-conspirator in the formulation and imposition of the AOCs on DOE and NASA, it appears that there is an ongoing conflict of interest and DTSC is seemingly incapable of concluding that the 2010 AOCs are more harmful than beneficial, despite ample evidence

This becomes even more problematic when one considers the fact that on April 24, 2017, Boeing filed a conservation easement for its portion of SSFL that would maintain the property in perpetuity as open space. This essentially moots any consideration of risks from either agricultural or residential end uses. Because the NASA portion of the site, which represents about 15.5 percent of the total area, is essentially land locked and unsuitable for either agricultural or residential development, it is now obvious that the cleanup of entire site should be evaluated from the perspective of an end use as open space or recreational. In order to provide the stakeholders and decisionmakers a complete picture of the possible effects of a range of cleanup alternatives, DTSC should consider requesting evaluation of a full site cleanup following EPA risk-based procedures for a recreational open space end use.

DTSC states that the PEIR analyzes the environmental impacts of the most extensive set of cleanup activities evaluated and proposed for the Boeing project, and captures the environmental impacts of a cleanup for less intensive land use scenarios that could result in removal of less soil and sediment from the project site, a smaller project footprint, and a shorter project duration. However, it is not clear from the document what would be the conclusions from a specific risk-based analysis of an open space end use. Nevertheless, there is sufficient information already available to conclude that the significant environmental impacts attributable to the 2010 AOCs can be greatly reduced, possibly to the level of insignificance. While some people believe that the 2010 AOCs are needed to prevent SSFL surface water runoff from transporting contamination to surrounding communities and water supplies, data taken during last winter's heavy rains showed no significant transport via that pathway.

### **3. Incorrect Evaluation of Purported Radiological Contamination and the Consequences Thereof**

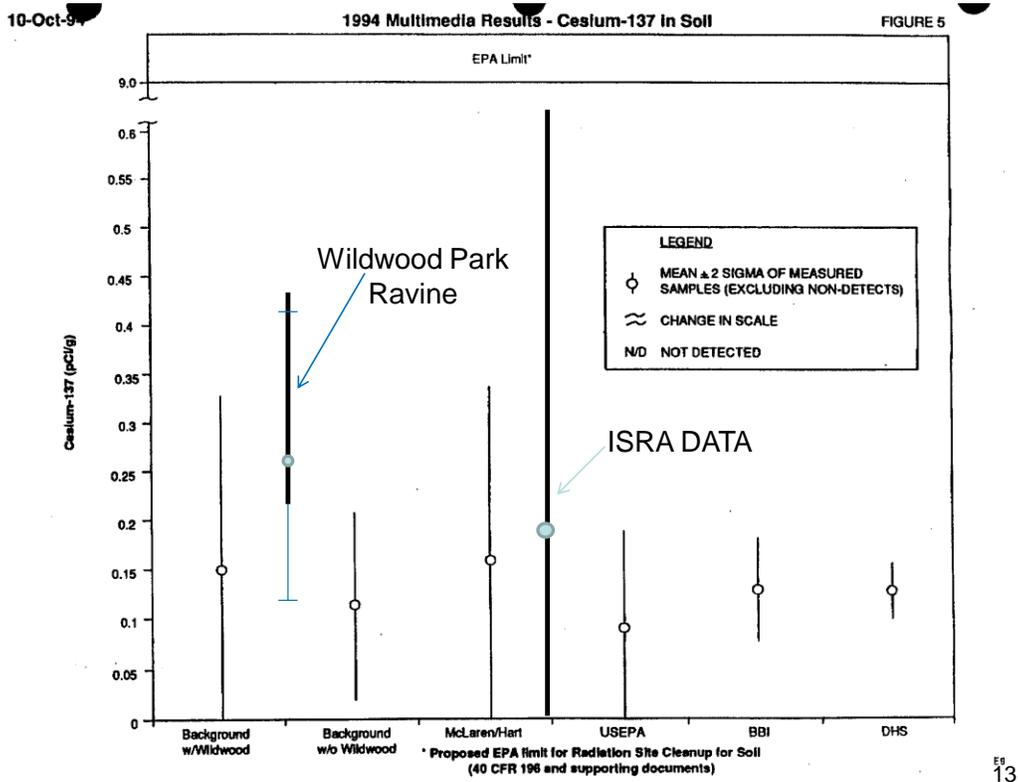
Lack of understanding of radiation, radionuclides, and their health effects has plagued the SSFL cleanup for years. The inability to distinguish between radiological contamination from SSFL operations and fallout from nuclear weapons testing has led to fear of the unknown, and cleanup requirements based not on well-known science, but on that fear. There is continuing untrue

propaganda that the 1959 SRE accident spread cesium and strontium throughout neighboring communities as well as the SSFL site. The claims are made despite the fact that environmental measurements at the time of the accident showed no such releases, even though the instruments could detect fallout from nuclear weapons testing in the USSR and the US. Additionally, strontium is not a volatile fission product and so could not be transported to distant locations via an air pathway.

Fear led to the \$45 million EPA radiological background study, reported in 2011, which was the basis for the 2012 EPA recommendations for the radiological lookup tables (LUT) upon which DTSC bases its PEIR. With substantial input from community stakeholders the study was made in three areas whose geological formations were the same as SSFL, but whose topography was not. At that time I provided technical information to both EPA and DTSC showing that many of the radioisotopes that were studied could only come from primordial radionuclides and not from nuclear reactor fuel and reactor operations. It was ignored. In 2011, Dr. Tom Rucker of SAIC provided other critical comments on the background data sets and their statistical treatment, which were ignored. Also in that time frame, I provided documentation showing that background from radioactive fallout from weapons testing would be substantially higher in the highly developed SSFL areas than in the undeveloped background study locations. This was ignored by EPA, which stated that the issue was the responsibility of DTSC. Despite numerous reminders, DTSC has failed to address this issue to this day. Almost 95 percent of the radiological contamination as defined by the 2010 AOCs is only slightly above the artificially low LUT values for the fallout nuclides Cs-137, Sr-90, and Pu-239. While the lack of technical training and knowledge relating to radionuclides and fallout in the general population can be excused, there is no excuse for DTSC as the regulator to continue to use questionable information and not to openly discuss the issues.

Because it is generally agreed that most of the contamination at SSFL is chemical in nature, the radiological questions might be thought of as relatively inconsequential. However, it can be clearly demonstrated that the determination of radiological background and radiological cleanup criteria will have substantial impact on the conduct and the environmental impacts of any cleanup as described in the PEIR. The evidence for this can be found in the well documented controversy over the disposal of the soil from the NASA ELV ISRA for Outfall 9 in 2009-2010. The soil had unacceptable levels of lead and dioxin, and also low levels of Cs-137. The Cs-137 was slightly above background and was deemed safe by the California Department of Public Health (DPH), Radiologic Health Branch to be removed and deposited in a Class 1 or Class 2 hazardous waste landfill. The activists objected and, supported by their elected officials, DTSC caused NASA to cancel its plans only one day later. The following figure illustrates the problems that are likely to occur if the 2010 AOCs are enforced without change. It should be noted that there is consistent data showing that background measurements in areas with more solid

impervious surfaces like rocks, pavement, or building roofs, show higher concentrations of Cs-137 in adjacent soil areas than in undeveloped terrain.



It is seen that the ISRA soil data is substantially higher than the measured background values, but more than a factor of ten below EPA residential risk limits. The ISRA soil is taken from a NASA area with no radiological activities but with paved areas and large rock outcroppings that would cause elevated background Cs-137 concentrations. From Boeing calculations, confirmed by DTSC calculations, if the Wildwood Park Ravine background measurements were included in the average background calculations, the ISRA soil would have been acceptable as below background including uncertainties. No one can explain why the Wildwood Park Ravine data was arbitrarily excluded from the approved background data set.

When one considers the possibility and even the likelihood that soil samples with Cs-137 concentrations similar to those of the ISRA samples will be found throughout the Boeing and NASA areas, where there were no radiological activities, together with the DTSC position that all “so-called” radiological contamination must be treated as low level radioactive waste or low level mixed waste, waste disposal costs and environmental impacts will be substantially greater than estimated in the DEIR.

There is the additional fact that all soil at SSFL contains approximately same the background levels of radionuclides and chemicals such as arsenic and dioxin. In the 2011 timeframe, I

assessed the risks from the background concentrations of radionuclides as measured by EPA. Similarly, Boeing calculated the residential background risk to be 2.1E-04 and the agricultural risk to be 1.1E-02. This was confirmed by DTSC in their response to public comments on the Agreements in Principle (AIP) which were incorporated into the 2010 AOCs. DTSC offered the specious rationale that because the background risk was so high, that all contaminants above background or detect, no matter how small and inconsequential, had to be removed. The AOCs also specify that the risk determination should be made on a point by point basis, rather than use the standard EPA procedure of averaging the sample concentrations over a nominal area such as 10,000 square feet. The reason for this area averaging is that the modeling that determines the risk parameters is based on an assumed uniform concentration over a standard 10,000 square foot area. In reality, the claim of any risk from an elevated concentration in a 1 square foot sample area as measured at SSFL is meaningless.

Another consequence of the high radiological background is that any truckload of soil from any of the SSFL areas will contain approximately the same total curies of radiological material and will therefore give the identical dose to that assigned to the radiological waste from the DOE area. This includes the backfill from the onsite borrow pit as apparently approved by DTSC. Not only will the backfilled area have essentially the same radiological risk and surface dose as the unremediated areas, any of the soil could be declared to be radioactive waste according to the DTSC criteria. Equally possible, the replacement soil might have a greater radiological inventory than the soil that was removed.

The PEIR also includes the following text that causes further increases the environmental impact of the proposed cleanup by insisting that even the Boeing must meet the requirements of the 2010 AOCs. The significance of this is that DTSC intends to force the removal of any negligible risk material that might blow from one area to another any time in the future.

“Cleanup of contamination from Boeing areas onto DOE or NASA managed properties would require coordination between Boeing, and DOE or NASA, respectively, but the soil cleanup for the DOE and NASA managed areas is governed by the 2010 AOCs (e.g., Boeing may conduct soil excavation to risk-based cleanup levels on the DOE or NASA managed property, but DOE or NASA are responsible for ensuring the soil cleanup is consistent with the 2010 AOCs).”

There are other items of interest that indicate that DTSC seems more concerned with implementing the AOCs than safeguarding human health and environmental quality. Several are in PEIR Section 3.7.3.1, DOE Building Demolition Activities. Building 4019 was used for criticality acceptance tests on Systems for Nuclear Auxiliary Power (SNAP) reactors before they were delivered for launch. I worked at SSFL from 1962 to 1965 on SNAP reactors and can personally attest to the fact that the very limited short-term zero-power criticality tests would not

have induced significant radioactivity in the below grade concrete vaults. Building 4024 was used to test SNAP reactors at power, each for approximately one year. Neutrons from the operating reactors would create radioactive isotopes within the concrete vaults, but most will have decayed away over the intervening 50 years.

DTSC notes that removal of the subsurface vaults would result in a 40-foot deep excavation that would be backfilled or otherwise stabilized after the vaults are removed. Considering the fact that there is very little radioactivity contained in the concrete and that it is already sequestered from the environment 40 feet below grade, there seems to be little benefit, if any, and considerable environmental disturbance to remove and transport the concrete vault material. A far more rational approach that has been used in other DOE remediation efforts would be to demolish only the upper portions of the vaults, place the debris in the lower portion and grout the entire mass in place. This would minimize demolition, excavation, transport, and backfill.

RMHF is another example. DTSC states that regardless of the historical use of specific features within the RMHF, given the proximity to areas that did treat or handle radiological or mixed waste, all material from these RMHF features would be disposed of at NNSS, or an alternate facility permitted to receive radiological materials. There is no basis for assuming that proximity to areas that handled radiological material or waste is sufficient to create additional radiological contamination. For example, structural steel from RHMFC could become radioactive only by irradiation with neutrons, but not from proximity to other radioactive materials.

Additionally, DTSC states that the Governor's Moratorium (Executive Order D-62-02 [2002 17]) requires material from decommissioned facilities to be disposed of in a Class I hazardous waste facility. Actually, D-62-02 states only that regulations should be adopted:

**"IT IS ORDERED** that the Department shall adopt regulations establishing dose standards for the decommissioning of radioactive materials by its licensees.

**IT IS FURTHER ORDERED** that in adopting such regulations, the Department shall assess the public health and environmental safety risks associated with the disposal of decommissioned materials, and shall comply with all applicable laws, including the California Environmental Quality Act."

### **Conclusions and Recommendations**

An objective reader of the PEIR should agree that there are significant environmental impacts from the SSFL remediation project as defined by DTSC. It should also be clear that most of environmental impacts would be caused by implementing the 2010 AOCs. As shown in Appendix G, DTSC's evaluations of Human Health in Area IV and the Northern Buffer Zone concludes that even the No Action Alternative for soil results in a low probability of adverse health effects associated with potential onsite exposure of both suburban residents or recreational

users. Clearly, the 2010 AOCs have negligible on-site benefits, and certainly no off-site benefits. DTSC staff has testified under oath that the 2007 Agreements with Boeing, NASA, and DOE were protective and there has never been any reason provided for the 2010 AOCs other than fear and political influence.

Sufficient information has been provided by the responsible parties to demonstrate that there are potential risk-based remediation alternatives that would substantially reduce the environmental impacts while safeguarding human health. The draft Program Management Plan (PMP) is based on full implementation of the 2010 AOCs, rather than consideration of any of the documented alternatives. The DEIR does not offer any viable alternative that would avoid the documented significant environmental impacts.

The draft PMP contains the following:

“If DTSC concludes that the project results in significant and unavoidable effects, which are identified in the PEIR, DTSC must adopt a “statement of overriding considerations” prior to approving the project, and provide written rationale on how DTSC balanced the benefits of the project and the significant and unavoidable environmental impacts. Where DTSC concludes that the economic, legal, social, technological, or other benefits outweigh the unavoidable environmental impacts, DTSC may find such impacts “acceptable”, approve the project, and certify the PEIR.”

The statement ignores the obvious alternative of rejecting the project simply because the benefits of the project have not been established, and any potential benefits are far outweighed by the environmental impacts. There are no “overriding considerations” except political interference.

Alternatively, the project and the DEIR can be modified and then reevaluated. To reach an environmentally acceptable remediation plan, it is recommended that DTSC:

- Eliminates all political influence in its decisions relating to the SSFL remediation,
- Abrogates the 2010 AOCs with the likely support of DOE and NASA, and defaults to the protective 2007 agreements,
- Evaluates and documents a uniform sitewide remediation alternative that includes:
  - Soil removal based on open space end use and risk-based criteria applied according to customary EPA remediation procedures.
  - Minimum impact building demolition, and
  - Groundwater Natural Monitored Attenuation.

It is highly likely that such an open space risk-based remediation would substantially reduce the significant environmental impacts and be much more affordable and timely.