UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

LOCKHEED MARTIN CORPORATION,	)	
Plaintiff,	)	
v.	)	**Civil Action No. 08-1160 (ESH)**
	)	**UNDER SEAL**
UNITED STATES,	)	
Defendant.	)	

MEMORANDUM OPINION

Lockheed Martin Corporation brings this action against the United States under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. § 9601 *et seq.*, for recovery of past and future response costs to remediate the environmental contamination caused by its corporate predecessor's operation of three rocket motor-production facilities – Redlands, Potrero Canyon, and LaBorde Canyon – in California from 1954 to 1975. Both parties admit to being liable as potentially responsible parties ("PRPs") for the contamination at the three facilities under CERCLA § 107(a). The Court held a twelve-day bench trial from February 10 to March 14, 2014, to determine the equitable allocation of response costs between the parties. Having considered the evidence, the controlling law, and all relevant equitable factors, the Court has determined that an equitable allocation for the past response costs for all three facilities is 0% liability to the United States and 100% liability to Lockheed. In contrast, the Court will equitably allocate future response costs between the parties differently for each facility: 29% to the United States and 71% to Lockheed for the Redlands facility; 24% to the United States and 76% to Lockheed for the Potrero Canyon facility; and 19% to the United States and 81% to Lockheed for the LaBorde Canyon facility.

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BACKGROUND[1]

I. HISTORY OF THE SITES

The environmental contamination that underlies this action arose from the operation of solid propellant rocket production facilities by Lockheed Propulsion Company ("LPC")[2] at three locations in Redlands and Beaumont, California – the Redlands facility, the Potrero Canyon facility, and the LaBorde Canyon facility (collectively the "Sites") – between 1954 and 1975.

A. Government contracts for solid propellant rockets at the Sites

LPC researched, developed, and manufactured state-of-the-art solid propellant rocket technologies at the Sites in support of military and scientific programs critical to the United States' Cold War efforts. (Roman Decl. ¶¶ 21, 23.) Government interest in the development of solid propellant rocket technologies grew significantly in the 1950s following the Soviet Union's successful nuclear tests in 1949 and the Sputnik launches in 1957. (*Id.* ¶¶ 19, 24-25.) Rocket motors using solid propellants offered, at a lower cost, several benefits over their liquid-based counterparts – greater safety, operational readiness, and reliability. (*Id.* ¶ 24, 27.) The

[1] What follows in this section, although labeled "Background" and generally undisputed by the parties, constitutes findings of fact in accordance with Fed. R. Civ. P. 52.

[2] Grand Central Rocket operated the Sites from 1954 to 1963, when LPC purchased the company. (USX88.0044.) For simplicity's sake, the Court will refer to GCR and Lockheed Propulsion Company as "LPC." During its existence, LPC was an operating division of Lockheed Aircraft Corporation, which, in 1977, became the Lockheed Corporation. The Lockheed Corporation merged with the Martin Marietta Corporation in 1995 to form the Lockheed Martin Corporation.

Eisenhower administration's decision to initiate the development of several large missile programs and to prioritize the research and development of solid propellants created the market for a private solid propellant industry. (*Id.* ¶ 33.) As the only purchaser of advanced solid propellant rockets at the time, the United States held monopsonistic control over the solid propellant industry. (Trial Tr. 65-66 (Roman); Roman Decl. ¶¶ 5, 34.)

LPC was one of the largest participants in that industry, and as a contractor, it developed or manufactured rockets for eight major Cold War programs: the Vanguard artificial satellite, the Explorer artificial satellite, the Nike-Zeus anti-ballistic missile system, Project Mercury, the Apollo Program, the Large Solid Propellant Motor Program, the TAGBOARD reconnaissance drone, and the Short Range Attack Missile ("SRAM") program. (Roman Decl. ¶¶ 7, 35.) President Eisenhower designated four of these programs – Vanguard, Nike-Zeus, Mercury, and Apollo – as of the "highest national priority." (*Id.* ¶¶ 7, 23.)

As described by three aeronautics scholars, "[t]he brief life of the Lockheed Propulsion Company was marked by rather modest, but notable historical and technical achievements in solid rocket development." (PX0088 at 14.) LPC contributed to four major Cold War space programs both as a developer and manufacturer of solid propellant rocket motors. In the 1950s, LPC developed and manufactured the third-stage motor for the Vanguard satellite program and loaded solid propellants into motors for the Explorer satellite program. Following the first of many successful launches into orbit in 1958, both Vanguard and Explorer were foundational space race programs. (Roman Decl. ¶¶ 8, 36-37.) LPC later developed and manufactured launch escape motors for Project Mercury, the United States' first manned space program. The escape motors – critical for the safety of the astronaut in the event of an emergency during a launch – had a 100% reliability rate over numerous tests and missions. (*Id.* ¶¶ 10, 40-41.)

Finally, LPC developed and manufactured the launch escape and pitch control motors for the Apollo manned lunar exploration program. The motors were part of the space capsule for eight Apollo lunar missions, including Apollo 8, the first manned orbit of the moon in December 1968, and Apollo 11, the first manned lunar landing in July 1969. (*Id.* ¶¶ 11, 42-43.)

From 1958 to 1974, LPC also researched, developed, and tested large solid propellant motors for NASA and the Department of Defense ("DOD"). Large solid propellant motors were necessary to generate enough thrust to lift large vehicles into space. Under the Large Solid Propellant Motor Program, LPC designed, fabricated, and tested the first 120-inch and 156-inch solid propellant motors and contributed to numerous technological advances later incorporated by competitors in the Space Shuttle and ballistic missile programs. For instance, the "Lockseal" device developed by LPC as a solution to solid propellant rocket thrust vector control became a mainstay in the solid propellant rocket industry. (*Id.* ¶¶ 12-13, 44-45.)

LPC also contributed as a developer and manufacturer to the conventional Cold War arms race. LPC developed the second-stage motor for the Nike-Zeus missile, a surface-to-air missile designed to destroy incoming nuclear warheads. The Nike-Zeus missiles were successfully tested in 1958 and 1959. (*Id.* ¶¶ 38-39.) LPC also developed and produced forty-five motors for the then-highly classified TAGBOARD reconnaissance drone program in the late 1960s. LPC designed motors capable of allowing the unmanned drone to reach an altitude and speed that would ignite the drone's ramjet. Once the ramjet ignited, the drone could reach speeds in excess of Mach 3 and photograph an area sixty miles wide and 3000 miles long in a single flight. The government ultimately discontinued TAGBOARD in 1971 for technical and political reasons. (*Id.* ¶¶ 49-50; *see also* PX0088 at 13.)

LPC's largest contracts, however, were for the SRAM program. The SRAM was a nuclear-armed air-to-ground missile designed for use on the aerial front lines in the case of an American invasion into Soviet territory. (Roman Decl. ¶ 51.) LPC developed and manufactured a revolutionary two-pulse solid propellant rocket motor, which enabled an individual SRAM to shut down and then restart mid-flight. This innovation created the possibility for three distinct flight profiles and an "omni-directional" striking capability for each missile. (*Id.* ¶¶ 51, 54, 70-71; *see also* Trial Tr. at 68 (Roman).)

The Air Force developed the technical requirements for the SRAM program in the spring of 1964. (Roman Decl. ¶ 53) The Air Force Rocket Propulsion Lab ("AFRPL") initiated SRAM research and development contracts with LPC, as well as several of its competitors, that same year. (Trial Tr. at 1340-41 (Dull).) LPC was the only contractor to successfully demonstrate the feasibility of a two-pulse motor during its research and development contracts. (Roman Decl. ¶ 54.) In 1966, Boeing won the development contract for the SRAM program (Trial Tr. at 1339, 1341 (Dull)) and awarded the subcontract for the development of the propulsion system – *i.e.*, the solid propellant rocket motor – to LPC. (Roman Decl. ¶ 55.)

Numerous technical difficulties and rocket failures plagued the SRAM program. (Trial Tr. at 1341 (Dull); Roman Decl. ¶¶ 56-60.) The September 1969 initial qualification tests for the SRAM motor were unsuccessful. (Roman Decl. ¶ 61.) Shortly thereafter, Boeing and LPC filed a $54.2 million claim against the Air Force asserting that the SRAM propulsion system requirements were "unattainable" and "grossly impracticable." The Air Force settled the claim for $20 million before it could be adjudicated. (*Id.* ¶ 63.)

Setbacks notwithstanding, the Air Force deemed the SRAM motor fit for production in 1971. The Air Force awarded Boeing the first production contract, and Boeing awarded LPC a

one-year production subcontract worth $27.6 million. (*Id.* ¶ 64.) The Air Force awarded Boeing four more production contracts, and Boeing and LPC entered into four additional production subcontracts between 1972 and 1975. During that period, LPC produced 1500 SRAM solid propellant rocket motors and completed 107 consecutive successful test fires. (Trial Tr. at 1395-96 (Dull); Roman Decl. ¶ 68.) Each SRAM was 150 inches long, nearly 18 inches in diameter (s*ee* Trial Tr. at 1337 (Dull)), and carried a thermonuclear weapon with a yield of approximately 170 kilotons, roughly ten times the yield of the atomic bomb the United States dropped over Hiroshima during World War II. (Roman Decl. ¶ 69.) Thus, a B-52 bomber with the capacity to carry 20 SRAMs had a destructive power equivalent to 200 Hiroshima bombs. (*Id*.)

In light of decreased government focus on solid propellant rocketry for defense and space exploration purposes, LPC ceased its operations in the summer of 1975 at the end of its fifth SRAM subcontract. (*Id.* ¶ 68.) Nonetheless, SRAMs – all of which contained solid propellant motors produced by LPC – remained a mainstay in the United States' arsenal through the 1980s and were considered critical to the deterrent effect of the United States' strategic bomber force. (*Id.* ¶¶ 70-72.) Even twenty years after the first successful SRAM test firing, the Soviet Union had not developed an air defense system capable of neutralizing the omni-directional capabilities of SRAMs provided by LPC's two-pulse rocket system. (*Id.* ¶ 71.)

B. Solid propellant rocket operations at the Sites

While the parties dispute what happened on a day-to-day basis with respect to operations at the Sites, particularly relating to the disposal of the hazardous substances, many of the background facts are undisputed.

LPC began its rocket motor production operations at the nearly 500-acre Redlands facility in 1954 when it leased the facility from the City of Redlands. (USX15; *see also*

USX11.0020-21.) Between 1958 and 1962, LPC acquired the parcels comprising the much-larger 9,100-acre Potrero Canyon and 2,500-acre LaBorde Canyon facilities located near Beaumont, California. (USX12.0044.)[3] Lockheed researched and manufactured solid propellant rockets at the Redlands facility from 1954 to 1975. (USX11.0018-20.) LPC used the Potrero Canyon facility for manufacturing solid propellant rockets, testing rocket motors, and washing out defective rocket motors for re-use from 1958 to 1974. (Sterrett Decl. ¶ 213; USX12.0046.) LPC used the LaBorde Canyon facility for assembling small rocket motors, testing rocket motors, and washing out defective motors for reuse from 1958 to 1974. (Sterrett Decl. ¶ 214; USX13.0011-12.)

The design, testing, and production processes for LPC's contracts followed a general protocol. The government provided requirements regarding the performance, dimensions, and interface points of the solid propellant rocket motor. (Trial Tr. at 78 (Oppliger).) From those specifications, LPC's engineering analysts manipulated the composition of the propellant and the physical design of the propellant grain within the rocket casing to achieve desired rocket performance. (*Id.* at 78-79.) LPC engineers then designed the rocket casing and casing insulation based on the characteristics of the propellant grain design. (*Id.* at 80.) From there, LPC began the iterative process of testing subscale (and eventually to-scale) rockets against the government-provided specifications. (*See id.* at 80-83.)

Although LPC's applications of solid propellant rocket technology were state-of-the-art, solid propellant rocket motors themselves are "simple units" with "no moving parts." (PX91 at

[3] Today, the San Bernardino Valley Water Conservation District owns the majority of the Redlands facility and uses portions of it for water spreading to recharge groundwater. Operators of an industrial park own the remaining sixty-six acres of the Redlands facility. (USX11.0021.) California owns and manages as a wildlife area all but nearly 600 acres of the Potrero Canyon facility. Lockheed owns the remaining acreage under a conservation easement. (USX12.0047.) The County of Riverside has owned the LaBorde Canyon facility since 2006. (USX13.0011.)

934.) A solid propellant rocket "motor consists of an encased energy supply, which is a combustible mixture of all of the elements required for the generation of propulsive energy" – it is self-contained and ready to fire when it leaves the factory. (*Id.*)

A solid propellant is composed of three basic components – an oxidizer and two fuels, a "rubber-like binder" and powdered aluminum. (*Id.* at 935.) Because solid propellant combustion occurs in the closed environment of a rocket's core, a solid propellant requires much more oxidizer than fuel. (*Id.* at 955.) The oxidizer used by LPC consisted of precise proportions of ground and unground ammonium perchlorate ("AP"). LPC used several grinders at the Sites to grind raw AP down from 200 microns in diameter (unground) to precise sizes of less than eight microns in diameter. (*Id.*) LPC combined the ground and unground oxidizer with a fuel slurry in a large mixing machine to produce a homogenous fluid propellant. (*Id.* at 958.)

LPC then "cast" the fluid propellant into the rocket motor case under vacuum conditions, and "cured" the rocket by heating the cast for nearly a week to "stiffen[] it into a rubbery, shape-retaining mass." (*Id.* at 935, 961.) LPC produced these solid propellant motors in short, cylindrical segments that could be joined to complete the rocket motor. (*Id.* at 940.) Once the nozzle and igniter were added, the rockets were ready for either testing or shipment. (*Id.* at 938.)

Aside from providing the initial specifications for a particular solid propellant rocket motor, the government played several additional roles in the design, testing, and production of a rocket.[4] First, as a government contractor or subcontractor, LPC had to comply with any military and federal specifications incorporated in a particular contract. (PX1057 ¶¶ 13-14 (Speer Decl.).) Deviation from government specifications required government review and approval. (*Id.* ¶ 14.) Second, LPC's contracts often incorporated by reference specific safety and

[4] Because of the lack of contracts and documents from the LPC's earlier years, this section focuses primarily on LPC's later – and biggest – subcontracts under the SRAM program.

production manuals. (*See* Trial Tr. at 941 (Nagle); *see also, e.g.*, PX0001-0003, 0005, 0007, 0009.) The manuals provided guidance for best practices regarding safety and production processes. Although LPC was not required to comply with all aspects of the referenced and applicable manuals, LPC was required to comply with, or to seek a waiver or deviation from, any directives in the manuals that used the words "shall" or "must." (*See* Trial Tr. at 439 (Delaney); *id.* at 941 (Nagle); PX0007 § 102). Waivers or deviations, however, were commonly sought and granted. (Trial Tr. at 941 (Nagle); *see, e.g.*, PX400.)

Specifications aside, the government had limited input into LPC's technical development of solid propellant rocket motors under government contracts. In the mid-1960s, the government adopted the so-called Total System Performance Responsibility ("TSPR") for the SRAM contracts, meaning that the prime contractor – Boeing – and its subcontractor –LPC – had "total system responsibility to build th[e SRAM] without any more direction from the Air Force." (Trial Tr. at 1338 (Dull); *see* USX222.0003.) "The Air Force provide[d] a statement of work, what [it] want[ed] to be built, and a system spec that goes into technical details" regarding performance, but it did not "dictate the design" of the rocket. (Trial Tr. at 1338 (Dull).)

Given the technical complexity of the SRAM program, LPC held daily early morning meetings to discuss pertinent program details. (*See* Trial Tr. at 86 (Oppliger).) Government representatives from the Air Force Systems Program Office ("SPO")[5] and the AFRPL attended these meetings, as well as other technical interchange meetings scheduled by Boeing, only on invitation by Boeing. (*Id.* at 1341, 1345-47 (Dull).) Although the frequency of these meetings increased over time due to the repeated rocket motor failures that plagued SRAM, government representatives at the meetings were instructed not to provide direction, but to only "observe,

[5] The SPO, located at Wright-Patterson Air Force Base near Dayton, Ohio, was the Air Force division responsible for procuring weapons systems, including SRAM. (Trial Tr. at 1335-36 (Dull).)

take notes, and report back to . . . supervisors." (*Id.* at 1347-48.) Even at SRAM's preliminary design review, which included high-ranking officials from LPC, Boeing, and the Air Force, the Air Force representatives attended only "as observers to witness the progress at [LPC] at that time." (*Id.* at 1349.) Waste disposal practices were not discussed at these technical meetings. (*Id.* at 1352.)

At the beginning of its SRAM development subcontract, LPC formed the SRAM Propulsion Program Review Committee to provide LPC monthly guidance on meeting the SRAM program's technical and schedule objectives. (PX0571 at 443.) The Committee was initially comprised of Lockheed Aircraft Corporation employees who did not generally work for LPC at the Sites. (*Id.*) In early 1968, pending the commencement of SRAM rocket motor test firing, LPC , with the permission of Boeing, expanded the Committee to include several outside experts, including Boeing engineers, scholars, and Donald Ross, "Mr. Solid Rocket," from the AFRPL. (*Id.* at 444, 446; *see* Trial Tr. at 1369-70 (Dull).) Although Mr. Ross was generally an "observer" under the TSPR (Trial Tr. at 1370 (Dull)), he provided some technical input to LPC through the Committee. (*See* PX0571 at 0439.) LPC promptly implemented many of the improvements recommended by the expanded Committee. (*See* Roman Decl. ¶ 60.)

In 1970, at the request of the SPO, the AFRPL reviewed the design of the SRAM rocket motor, the test firing results, and LPC's tooling and manufacturing processes and internal procedures, to ensure that LPC "w[as] ready for production" and to "document the things that needed to be completed" before SRAM rocket motor production could begin. (Trial Tr. at 101, 104-05 (Oppliger); *see also* Trial Tr. at 1356 (Dull); PX0577 at 110.) Pursuant to this review, the AFRPL provided eight recommendations to Boeing regarding LPC's readiness for SRAM rocket motor production. (*See* PX0577 at 115-18.) These recommendations ranged from the

procedural – recommending that Boeing conduct a First Article Contractual Inspection following the eight test motor firings – to the prudent – suggesting that LPC's engineering work force could be reduced by fifty percent once development ended and production began. (*Id.* at 116, 118.) Although the government recommendations did not bind either Boeing or LPC (Trial Tr. at 1376-77 (Dull)), LPC ultimately adopted many of them. (*Id.* at 106 (Oppliger).)

The government's quality assurance presence at the Sites was much larger than its technical development presence described above. Although LPC had its own safety and quality control inspectors (*id.* at 128), both Boeing (as prime contractor for SRAM) and the Defense Contract Administration Service ("DCAS") had offices at the Redlands facility and had the "right[]" to "roam the production floor and see anything they wanted to see and watch anything they wanted to watch." (*Id.* at 90-92, 94, 110-11.) DCAS officials, Boeing officials, and LPC engineers reviewed the process specifications and manufacturing process standards before production could begin and inspected the processes once underway. (*Id.* at 90.)[6] DCAS officials determined which steps in the production process they wanted to inspect and, in theory, a production process could not proceed beyond a dedicated inspection point until a DCAS official had inspected and "stamped off" the process. (*Id.* at 90-92.)

During the SRAM development and production contracts, DCAS had between four and five full-time representatives and Boeing had around twenty full-time employees stationed at the Redlands facility. (Trial Tr. at 111 (Oppliger); *id.* at 1346, 1357 (Dull).) By comparison, LPC

[6] "Process specifications" identified the applicable government specifications for a contract and provided a high-level description of the production process. (*See* PX1057 ¶¶ 16-17 (Speer Decl.); *see, e.g.*, PX328.) Manufacturing process standards, on the other hand, were "how-to" documents that provided step-by-step instructions for the completion of certain processes in compliance with the process specifications. (PX1057 ¶ 22; *see, e.g.*, PX913.) That is, "[m]anufacturing process standards were used to tell the operators how to do or how to use a certain piece of equipment or how to do a certain thing." (Trial Tr. at 117 (Oppliger).)

had around four hundred employees at the Redlands facility. (Trial Tr. at 139 (Oppliger); PX1202 at 133.)

The frequency and quality of inspections at the Sites varied over time. "The amount and kind of inspection to be performed by the Government [wa]s at the discretion of DCAS." (USX270.) In its 1970 review of the SRAM Rocket Motor, the AFRPL criticized all three parties – LPC, Boeing, and DCAS – for practicing a *laissez-faire* "'call us and we'll come and inspect'" approach to inspecting production processes. (PX577 at 117, 151-52; *cf.* PX576 at 48-49, 81.) The AFRPL therefore concluded that that the SRAM program had "not been receiving the on-station witnessing of work that the program has and continues to deserve" (PX577 at 151-52) and suggested that SPO recommend to Boeing and DCAS to "re-evaluate their inspection philosophy and inspection operations with a view to substantially increasing their on-station witness of work operations besides work results." (*Id.* at 117; *see also* Trial Tr. at 1375-76 (Dull).) After this review, both inspection points and the frequency of inspections increased at the Sites as the first SRAM production contract got underway. (Trial Tr. at 138 (Oppliger).) Nonetheless, DCAS continued to "lean[] on Boeing for engineering judgment and decisions essential to the quality assurance function." (USX221.0004.)

In addition to their daily quality assurance inspections, DCAS representatives also occasionally undertook safety inspections at the Sites. (*See, e.g.*, PX476-77, 482-84.)[7] However, these inspections were limited to safety risks involving fires and explosions inherent in the production, testing, and disposal of propellants and did not address safety risks regarding environmental pollution. (*See, e.g.*, Trial Tr. at 87 (Oppliger).)

[7] Prior to the creation of DCAS in 1964, the Los Angeles Ordnance District undertook safety inspections. (Trial Tr. at 960-61, 1013-14 (Nagle).)

C. General waste disposal practices at the Sites

Solid propellant rocket motor research, design, testing, and production processes produce myriad and voluminous waste streams including waste propellant (used, unused, and defective), waste solvents containing propellants, and scrap motors. (*See* PX457 at 801.) As a result, disposal of waste was "regarded as an integral part of solid propellant rocket operations." (PX0009 § 7-1.1.)

During its operations of the Sites, LPC used several organic solvents – including trichloroethylene ("TCE") and 1,1,1-trichloroethane ("TCA") – to clean the equipment used to produce the solid propellant rocket motors. At the Redlands facility, AP and propellant-laden wastewaters, AP and propellant-laden solvents, and solvents in general, were first piped, pumped, or transported via drums to "evaporation pits." (Trial Tr. at 669 (Feenstra); Feenstra Decl. ¶¶ 50-51.) These shallow, concrete-lined basins allowed the organic solvents and water to evaporate, leaving behind a residual sludge containing large amounts of AP. (*See* Trial Tr. at 700 (Feenstra).)

LPC ultimately disposed of most of its propellant wastes – including sludge taken from evaporation pits – by burning them in earthen "burn pits" at the Redlands and Potrero Canyon facilities. (Feenstra Decl. ¶¶ 51, 156.) In some instances, propellant wastes were disposed of off-site at Camp Irwin – a military facility in the Mojave Desert (now Fort Irwin). (*See id.* ¶ 42; PX431; PX440.)

An exception to disposal-by-burning existed, however, for defective rocket motor casings. Rather than burning the entire rocket motor – and ruining the expensive metal casing – LPC often attempted to reuse the motor casing by removing the propellant with water. In the 1950s, LPC did this by "soaking out" the scrapped rocket motors in evaporation pits at the

Redlands facility. (Feenstra Decl. ¶¶ 47, 152; *see also* PX429.) Later, LPC began "hogging out" defective rocket motors at the Potrero Canyon facility using high-pressure water jets to remove the propellant from the motor casing. (*See* Trial Tr. at 393 (Delaney); USX49.0068.)

II. CLEANUP OF THE SITES

As of the beginning of the trial, Lockheed had incurred environmental response costs for the Sites totaling nearly $287 million. Lockheed estimates it will incur another $124 million in future response costs for the Sites. (*See* Meyer Decl. ¶ 50 fig. 29.) Because each facility has a distinct operational and cleanup history, the Court considers them separately below.

A. Redlands facility

TCE[8] and perchlorate[9] are the principal contaminants driving the cleanup costs relating to the Redlands facility. Due to a combination of hydrogeologic factors around Redlands, the majority of the TCE and AP disposed of during LPC's operations is no longer located at the facility. (Sterrett Decl. ¶ 44.) Rather, the substances percolated through the soil and into the groundwater and have travelled downgradient to form the "Redlands plumes," [10] approximately four miles away. (*See generally id.* ¶¶ 29-45; *see also* Trial Tr. at 286-87 (Blackman).) Because

[8] TCE is now recognized as a probable carcinogen for humans (PX1621 at 263) and the ingestion of TCE-contaminated water has been associated with a wide variety of other health problems. (USX826.0023, 0067-0111.)

[9] During the trial, at the Court's direction, the parties and witnesses did not distinguish between "AP" and "perchlorate." However, the Court must distinguish between the two in this Memorandum Opinion: while AP is the oxidizer LPC used and disposed of at the Sites, perchlorate is the component of AP that contaminates the soil and groundwater at the Sites.

AP is an inorganic salt that "dissociates" in water into its constituent cation and anion: ammonium (NH_4^+) and perchlorate (ClO_4^-), respectfully. (*See* PX1224 at 1; PX1685 ¶ 3.) Perchlorate is highly soluble and mobile in water and chemically stable. As a result, perchlorate forms persistent contaminant plumes when it is released into surface or groundwaters. (PX1224 at 1.) Perchlorate is harmful to human health because, even in the low µg/L range, it can interfere with iodide uptake by the thyroid gland, thereby resulting in decreased thyroid hormone production. (PX1224 at 4, 35-36.)

[10] Although substantially overlapping, the perchlorate and TCE plumes are distinct. (Sterrett Decl. ¶ 46.)

the plumes are "detached" from the Redlands facility, environmental investigation of the facility cannot demonstrate a "direct connection" between specific locations (and thus production activities) at the facility and the plumes. (Sterrett Decl. ¶ 52.) That is, simply by looking at the plumes and the facility, one cannot reliably discern where in the facility the TCE or perchlorate originated.

1. Trichloroethylene

The California Department of Health Services first discovered the Redlands TCE plume in 1980. (PX1677 ¶ 1.) Throughout the 1980s, several municipal wells were shut down after testing revealed TCE concentrations above the California drinking water maximum contaminant level of 5 µg/L. (*Id.* ¶ 3.)[11] Lockheed began investigating the plume in the early-to-mid 1980s, concluding in 1985 that a local airport, and not LPC's activities at the Redlands site, was the "most likely source" for the TCE. (*Id.* ¶ 12.) Notwithstanding that conclusion, the Santa Ana Regional Water Quality Control Board instructed Lockheed to conduct further investigations into its operations at the Redlands site. (*Id.*) Lockheed and the Board continued investigating the Redlands facility as a potential source for the TCE plume into the early 1990s. (*Id.* ¶¶ 13-32.)

By October 1992, Lockheed argued that continued investigations into the Redlands facility would be fruitless because whatever TCE might have been disposed of at the facility had either volatized or dispersed through the porous soil and formed the detached Redlands TCE plume. (*Id.* ¶ 33.) In November, the Board informed Lockheed that it had concluded the Redlands facility was the source of the Redlands TCE plume and that it would order Lockheed to investigate and cleanup the plume. (*Id.* ¶ 34.) Lockheed replied that it would consider proposing

[11] As of 2008, the maximum TCE concentrations in the plume are in the mid-20 µg/L range. (USX11.0032.)

to the Board a remediation plan that would negate the need for any order and thereafter undertook a detailed study of the Redlands TCE plume. (*Id.* ¶¶ 34-35.)

On May 6, 1993, Lockheed denied responsibility for the plume, informing the Board that "it was [its] position that there was not substantial evidence to indicate that Lockheed was the source of the TCE contamination in the [Redlands plume], and that Lockheed, therefore, was not in a position where they could justifiably utilize stockholders' funds in conducting any additional work." (*Id.* ¶ 36.)[12] The Board responded on January 28, 1994, by issuing its first Cleanup and Abatement Order for the Redlands TCE plume. The Order required, *inter alia*, that Lockheed submit a workplan for using groundwater monitoring wells to define the plume and based on data gathered from those wells, submit and implement plans to first contain and then remediate the plume. (*Id.* at 10-11; *see also* Trial Tr. at 286-87 (Blackman).) On that same day, the Board also issued an "investigative order" requiring Lockheed to conduct groundwater and subsurface soil investigations at the Redlands facility. (PX1678 at 10; *see also* Trial Tr. at 285 (Blackman).) On April 22, 1994, after discussions with Lockheed, the Board modified its initial Cleanup and Abatement Order by removing the requirement that Lockheed implement any remedial actions for the plume while investigations were still ongoing. (PX1679 at 10-11; *see also* Trial Tr. at 295-96 (Blackman).) Lockheed continued to deny responsibility for the Redlands TCE plume (*see* USX653 (January 1994 letter from Lockheed to Board)), but otherwise complied with the 1994 Orders and worked with the Board to develop an acceptable remediation plan. (Trial Tr. at 296-99 (Blackman).)

[12] Mr. Blackman explained that Lockheed initially was unconvinced that the Redlands TCE plume originated from LPC's operations at the Redlands facility because testing of groundwater at the facility had not revealed the presence of TCE. (Trial Tr. at 288 (Blackman).) That is, Lockheed was unconvinced of its liability because the plume was "detached from" the facility. (*See id.*)

2. *Perchlorate*

In late April 1997, following a breakthrough in testing methodologies for perchlorate (*see* Trial Tr. at 301-03 (Blackman)), the California Department of Health Services discovered perchlorate levels in several wells within the Redlands TCE plume that exceeded California's provisional drinking water standard of 18 µg/L. (PX1685 ¶¶ 3-4.)[13] The Board connected LPC's use of AP at the Redlands facility – and in particular the waste disposal practices – with the Redlands perchlorate plume. (*Id.* ¶¶ 3, 5.) The Board accordingly issued a Cleanup and Abatement Order requiring Lockheed to investigate and then develop and implement a remedial action plan for the Redlands perchlorate plume. (*Id.* at 2.) Lockheed appealed the Order, but complied during the appellate process. (Trial Tr. at 337 (Blackman).) Because the Redlands facility was "the only source of [AP] in the" watershed, Lockheed eventually accepted responsibility for the Redlands perchlorate plume. (*See id.* at 307.) Further, after the discovery of the perchlorate plume, Lockheed "began to realize that the TCE, which was fully enveloped in the perchlorate plume, must have also come from the" Redlands facility as well. (*Id.* at 308.)

Since that time Lockheed has complied with all orders of the Board regarding investigation, containment, and remediation of the Redlands plumes, including working with water purveyors (*e.g.*, surrounding municipalities) to reduce TCE and perchlorate concentrations to acceptable levels and to drill new wells for drinking water supplies. (*Id.* at 314-17; USX11.0023-26.) Among other remedial steps, Lockheed treated from select wells TCE-laden

[13] As of 2008, maximum perchlorate levels in the plume ranged from 60 to 90 µg/L. (USX11.0031.)

groundwater with granular activated carbon and AP-laden groundwater with an ion exchange resin. (*See* Trial Tr. at 319-20 (Blackman); USX11.0041-42.)[14]

Although Lockheed has removed large amounts of TCE and perchlorate from the Redlands plumes, concentrations remain at levels that will require continued treatment that may "go on for many decades." (Trial Tr. at 321 (Blackman).) As of 2011, Lockheed had incurred over $231 million in response costs for the Redlands plumes.[15] (*See* Meyer Decl. ¶ 50 fig. 29.) Response costs for the Redlands plumes also make up the lion's share of the more than $25 million in response costs at the Sites from January 1, 2012 to February 10, 2014, and are expected to comprise the majority of the projected $125 million in future costs for the Sites. (Trial Tr. at 1188 (Lockheed counsel); *cf.* Meyer Decl. ¶ 50 fig. 29.)

B. Potrero Canyon facility

Although TCE, TCA-related compounds,[16] and polychlorinated biphenyls have been found in the soil and groundwater at the Potrero Canyon facility, perchlorate is the principal contaminant of concern at the facility. (Sterrett Decl. ¶¶ 22.) Unlike at the Redlands facility, the contamination at the Potrero Canyon facility is not detached, so the perchlorate contamination is traceable to specific locations at the facility. (Feenstra Decl. ¶ 155; Sterrett Decl. ¶ 216.)

[14] Granular-activated carbon is a less costly technology than ion exchange, which was developed specifically for perchlorate contamination. (Trial Tr. at 322 (Blackman).) While response costs for the Redlands plume in the 1990s were primarily from the cleanup of TCE, the recent, current, and future costs are perchlorate-driven. (*Id.* at 1188 (Lockheed counsel).)

[15] Facility-specific data are unavailable for response costs incurred after 2011. (*See* Meyer Decl. ¶ 50 fig. 29; *see also* USX378; USX401-402.)

[16] These compounds include 1,4-dioxane and 1,1-DCE. 1,4-dioxane is a chemical used to "inhibit" – or stabilize – TCA. (Feenstra Decl. ¶ 155.) Similarly, TCA – once "uninhibited" by the preferential removal of 1,4-dioxane in water – degrades in the presence of powdered aluminum (a fuel in rocket propellant) to 1,1-DCE. (Trial Tr. at 674-75 (Feenstra).) Thus, the presence of 1,4-dioxane and 1,1-DCE can indicate the prior disposal of TCA.

The primary sources of perchlorate soil contamination at the Potrero Canyon facility are the Large Motor Washout Area and the Burn Pit Area (Sterrett ¶¶ 220-21),[17] with perchlorate levels as high as 302,000 µg/kg and 171,000 µg/kg, respectively. (USX12.0229-30.) The former Rocket Motor Production Area is a secondary source area, covering a much larger portion of the facility but with lower perchlorate soil concentrations (20,400 µg/kg). (*Id.* at 0229, 0244-45.) The Sanitary Landfill is also identified as a secondary source area, with soil perchlorate levels as high as 67,300 µg/kg. (Sterrett Decl. ¶ 222; USX12.0233.)

The Burn Pit Area is the primary source of perchlorate groundwater contamination at the facility. (Feenstra Decl. ¶ 155; Sterrett Decl. ¶¶ 226-27; USX12.0237-38.) Secondary sources at the facility include the Rocket Motor Production Area and, to a lesser extent, the Large Motor Washout Area. (Feenstra Decl. ¶ 165; USX12.0237-38.)

In 1986, Lockheed conducted a historical study of the Potrero Canyon facility (along with the LaBorde Canyon facility) to better plan later investigations into environmental contamination. (*See* USX49.0011.) Following that study and a 1989 Consent Order from the California Department of Health Services, Lockheed has undertaken further remedial investigations and some remedial actions at the facility, the most recent and relevant beginning in 2002. (*See* USX12.0064-90.)

As of 2011, Lockheed had incurred nearly $21 million in response costs for the Potrero Canyon facility. (*See* Meyer Decl. ¶ 50 fig. 29.) Further remedial actions are presently under evaluation. (Feenstra Decl. ¶ 154; *see generally* USX699.144-300.) As of 2012, the preferred remedial alternative for perchlorate-impacted soils at the facility is excavation and off-site removal. The preferred remedial alternative for perchlorate-contaminated groundwater at the

[17] The TCE-contaminated soils identified at the facility – located in the Burn Pit Area – were remediated in the 1990s. (Sterrett ¶ 224; USX12.0233-35.)

facility hydraulic containment through the installation of a pump-and-treat system involving *ex situ* treatment of the groundwater, with the discharge of remediated water back into the ground or into local waterways. (USX699.0299-300.)

C. LaBorde Canyon facility

The soil and groundwater at the LaBorde Canyon facility are also contaminated with perchlorate and, to a lesser extent, TCE. (Sterrett Decl. ¶¶ 25, 238.) As at the Potrero Canyon facility, groundwater contamination at LaBorde Canyon is not detached and is therefore traceable to specific locations of historic operations at the facility. (*Id.* ¶ 235.) The primary sources of perchlorate at the facility are the Test Bay Canyons and the Waste Discharge Area. (Feenstra Decl. ¶ 167; Sterrett Decl. ¶ 239.) Perchlorate has been detected in soil at concentrations exceeding 100,000 µg/kg and in groundwater at concentrations exceeding 100,000 µg/L. (USX13.0236-38, .0241.)

As was the case at Potrero Canyon, Lockheed undertook a historical study of the LaBorde Canyon facility in 1986. (*See* USX49.0011.) The California Department of Health Services issued a Consent Order requiring cleanup of contamination at the facility in 1989. (USX13.0012.) Lockheed completed remedial investigations and removal actions from 1990 to 1993, after which the California Department of Toxic Substances Control issued a "Report of Completion of Removal Action" stating that no further remedial action was necessary. (*Id.*; USX700.0037-38.) Groundwater perchlorate contamination was first detected at the facility in the early 1990s. (Feenstra Decl. ¶ 174.) However, the California Department of Toxic Substances Control did not reopen the facility for further assessment until 2003. (USX13.0012.) Since then, Lockheed has engaged in nearly ten years of remedial investigations. (USX13.0027-31.)

As of 2011, Lockheed had incurred over $10 million in response costs for the LaBorde Canyon facility. (*See* Meyer Decl. ¶ 50 fig. 29.) Further remedial actions are currently under evaluation. (USX700.0148-206.) As of 2012, the preferred remedial alternative for the facility is limited shallow soil removal, plume containment, and institutional controls. (*Id.* at 0191, 0215.)

III. LOCKHEED'S INDIRECT RECOVERY OF RESPONSE COSTS THROUGH U.S.-GOVERNMENT CONTRACTS

Lockheed has recovered and continues to recover its response costs for the Sites (and others sites like them) from its customers by allocating its cleanup expenses to its contracts as indirect costs. Because the U.S. government is by far Lockheed's largest customer, to date Lockheed has indirectly recovered[18] $208 million – over 72% of its total past response costs for the Sites – through indirect costs charged to U.S.-government (primarily DOD) contracts.[19] Because the U.S.-government share of Lockheed's business is larger than it was in the past, the percentage of total response costs for the Sites that Lockheed has recovered through U.S.-government contracts is expected to rise in the future.

This cost-recovery system has its foundation in the byzantine federal contracting regulations and was formalized, as to environmental response costs in particular, by the Discontinued Operations Settlement Agreement ("DOSA") signed by Lockheed and the U.S.

[18] In its public filings, Lockheed refers to its formalized recoupment of environmental response costs through its contracts with the U.S. government as a "recovery." (*See* USX397.0069 (Lockheed 2012 Annual Report).)

[19] The vast majority of Lockheed's U.S.-government contracts are with the DOD. (*See* PX397.0017.) However, Lockheed also has contracts with NASA, the Federal Aviation Administration, the Social Security Administration, the Department of Treasury, the Department of Justice, the Department of Health and Human Services, the Environmental Protection Agency, and the U.S. Postal Service. (Trial Tr. at 1654 (Gatchel); USX397.0016.)

Defense Contract Management Agency ("DCMA")[20] in 2000. As a result of these regulations and the DOSA, the Court must decide, in determining the equitable allocation of response costs between the parties under CERCLA, what weight, if any, should be given to the fact that a government contractor (1) has already formally, though indirectly, "recovered" from the U.S. government a significant portion of its response costs through the pricing of its goods and services and (2) now seeks to directly recover from the U.S. government those same response costs under CERCLA. As the parties agree, this is an issue of first impression.[21] But before the Court can address that question, it must explain the relevant regulations and the DOSA, both of which complicate the resolution of this case.

A. The Federal Acquisition Regulations

Lockheed's cost-recovery system has an established basis in the complex Federal Acquisition Regulations ("FAR") that govern government contracting. Pursuant to the FAR, the government pays contractors both their "direct" and "indirect" costs, plus a profit. (Wright Decl. ¶ 84.) Direct costs are those costs related to a specific contract, such as materials and labor. *See* 48 C.F.R. § 31.202. Indirect costs are those costs not associated with a specific contract – essentially overhead. *See id.* § 31.203. Profit factors are determined on a contract-by-contract

[20] The DCMA is the component of the DOD that engages directly with defense contractors on issues of contract compliance.

[21] Although an issue of first impression, it is far from *sui generis*. Counsel for the parties identified at least two other cases involving Lockheed and the government where the same issue will need to be addressed. (Trial Tr. at 999-1000.) *See Lockheed Martin Corp. v. United States*, 06-cv-1032-RSL (W.D. Wash. filed July 21, 2006) ("Seattle Shipyards"); *Lockheed Martin v. United States*, 06-cv-1438-RJL (D.D.C. filed Aug. 15, 2006) ("Great Neck"). The issue was also raised in *Raytheon Aircraft Co. v. United States*, 2007 WL 4300221 (D. Kan. Dec. 8, 2007), but that case settled before trial. Because environmental contamination at defense contracting facilities is pervasive, the issue likely looms large in any case where a major government contractor can sue the government for recovery of environmental response costs under CERCLA. (*Cf.* Trial Tr. at 1996 (government closing).)

basis. (*See* Trial Tr. at 600-01 (Wright); *id.* at 1660-61 (Gatchel).) Across all contracts in 2013, Lockheed's operating margin (*i.e.*, pre-tax profit) was over 9.9%.[22]

The government will only reimburse a contractor for "allowable" indirect costs. An indirect cost is "allowable" if it is "reasonable," *i.e.*, "it does not exceed that which would be incurred by a prudent person in the conduct of competitive business," 48 C.F.R. § 31.201-3(a), is "allocable," complies applicable accounting standards, and is not otherwise disallowed by regulation or contract. *See id.* §§ 31.201-2, -4. Although not specifically allowable under the FAR, *see generally id.* § 31.205, environmental costs "are normal costs of doing business and are generally allowable costs if reasonable and allocable." (PX1862 § 7-2120.1 (Defense Contract Audit Agency Contract Audit Manual).)[23] Environmental cleanup costs at facilities no longer in operation are generally allocable as indirect costs. (*Id.* ¶ 7-7120.7.) Attorneys' fees and legal

[22] *See* Press Release, Lockheed Martin Corp., Lockheed Martin Reports Fourth Quarter and Full Year 2013 Results (Jan. 23, 2014), *available at* http://www.lockheedmartin.com/us/news/press-releases/2014/ january/0123hq-earnings.html.

[23] There was a movement in the late 1980s to make environmental cleanup costs, except for those at government-owned, contractor-operated facilities, unallowable; however, the proposal was ultimately withdrawn in the face of industry resistance. *See* Cpt. Gerald P. Kohns et. al., *A Primer on Contractor Environmental Remediation and Compliance Costs*, ARMY LAW., Nov. 1993, at 22, 28. In 1991, a revised draft environmental cost principle – proposed FAR § 31.205-9 – was approved by Defense Acquisition Regulation Council and by the Civilian Agency Acquisition Council. Cpt. Joshua H. Van Eaton, *A Not-So Equitable Allocation: The Need for an Environmental Cost Principle*, 14 MO. ENVTL. L. & POL'Y REV. 441, 459 (2007). The proposed principle would have disallowed environmental cleanup costs except where the contractor could show that it was performing a government contract at the time of the disposal that required cleanup and that performance of the government contract caused the disposal. *Id.* at 460. Even in those instances, however, the contractor would also have to demonstrate reasonableness of costs, due diligence, compliance with environmental standards of care and laws at the time of disposal, and the exhaustion of legal remedies to defray cleanup costs. *Id.* at 473-74. The regulation was never finalized, presumably because of the moratorium on new regulations in effect at the time. *Id.* at 460. Even so, the U.S. Government Accountability Office continued to press for the development of an environmental cost principle to address what it considered to be inconsistent – and ultimately detrimental to the government – treatment of environmental costs by contractors. *Id.* at 461-63. In 1997, after years of industry resistance, the DOD ultimately abandoned its efforts to develop an environmental cost principle. *Id.* at 463-64.

costs incurred while pursuing a CERCLA action may also be treated as indirect costs. *See* 48 C.F.R. § 31.205-47.

For a fixed-price contract, contractors attempt to predict the incurrence of indirect costs that will be allocated to that contract over its term. Because the price of the contract is fixed, the contractor benefits from a relatively higher return on its contract if it overestimates the total indirect costs; on the other hand, if the contractor underestimates the total indirect costs, it will receive a relatively lower profit on that contract. In contrast, in cost-reimbursement contracts the contractor is paid for all allowable direct and indirect costs allocated to the contract. Thus, over- or under-estimating indirect costs with regard to a cost-reimbursement contract does not pose the same potential for increased or reduced returns. (*Cf.* Trial Tr. at 1660, 1679 (Gatchel).)

Even after the contractor has allocated indirect costs to specific contracts and has been paid for those costs pursuant to those contracts, the contractor must credit back to the government "either as a cost reduction or by cash refund" any "applicable portion of any income, rebate, allowance, or other credit relating to" those indirect costs "received by or accruing to the contractor." 48 U.S.C. § 31.201-5. For environmental cleanup costs in particular, this provision requires a contractor to credit back to its indirect environmental cost pool any recoveries for cleanup costs from insurance policies or other PRPs. (Wright Decl. ¶ 50.)

B. The Discontinued Operations Settlement Agreement ("DOSA")

Lockheed and the DCMA recognized the allowability and appropriate accounting treatment of environmental remediation expenses as indirect costs when they signed the DOSA on September 6, 2000. (USX1033 at 10.) The DOSA formally allowed as indirect costs, *inter alia*, environmental response costs incurred for "discontinued operations," sites, or facilities that

Lockheed closed, abandoned, or sold prior to January 1, 2000, including all three Sites at issue in this case. (*Id.* ¶¶ 1.7-.8.)

Under the DOSA, Lockheed collects its environmental response costs for discontinued sites in an accounting pool at the corporate level – the Settled Discontinued Operations Pool ("DiscOps Pool").[24] (*Id.* ¶ 2.4.) Environmental response costs in the DiscOps Pool are not charged to contracts immediately upon incurrence; instead, the costs for a given year are amortized over a five-year period. (USX407 at 5; Mateer Decl. ¶ 8.) Both parties benefit from amortization because it smoothes costs over time, thereby increasing predictability in multi-year contract prices and promoting uniformity and comparability in the measurements of contract costs. (Mateer Decl. ¶ 9; *see generally* PX1859 at 3-4.)

Lockheed "flows down" the allocable costs for a given year from the DiscOps Pool to its business units using a three-factor formula typically used in government contracting. (USX1033 ¶ 2.8; Wright Decl. ¶ 45.) It is the business units that then develop indirect rates, based partially on the DiscOps Pool, to use when bidding on and billing government contracts. (Wright Decl. ¶ 45; Mateer Decl. ¶¶ 10-12.) The percentage of Lockheed's indirect costs passed on to U.S.-government contracts roughly correlates with the U.S. government's share of Lockheed's business for a given year. (Wright Decl. ¶ 74.)

Thus, under DOSA, if Lockheed spent $10 million on environmental response costs at discontinued operations in the year 2005, it would amortize those costs over the next five years, and $2 million per year would flow down to its business units from 2006 to 2010. Assuming that U.S.-government contracts make up 80% of Lockheed's business, Lockheed would recover $1.6

[24] The DOSA also settled disputes between the parties as to the allowability of past response costs allocated as indirect costs through the DiscOps Pool from 1991 onward. (*See* USX1033 ¶¶ 2.9-.11.) Importantly, the DOSA merely formalized past practice and did not materially affect how Lockheed had treated or would continue to treat the recovery of response costs for the Sites.

million per year – or $8 million total – of the response costs through its government contracts. In addition, Lockheed would recover the remaining $400,000 per year – or $2 million total – in an identical manner from non-U.S. government contracts.[25]

The DOSA also provides that Lockheed "shall not realize a double recovery with regard to any Settled Discontinued Operations Costs," and to the extent that it does, it "will reimburse the United States for any such double recovery . . . under government contracts." (USX1033 ¶ 4.7.) Pursuant to this provision, and as required under 48 C.F.R. § 31.201-5, Lockheed credits to the DiscOps Pool any direct payment it receives for environmental remediation costs at its discontinued operations, whether in the form of insurance proceeds, settlements, or other recoveries. (Wright Decl. ¶ 50; Mateer Decl. ¶ 14.) Credits are treated the same as costs and are amortized over the five years following receipt of the payment. (Wright Decl. ¶ 51.) Therefore, credits represent a bottom line reduction to the DiscOps Pool, lowering the total indirect costs passed on to Lockheed's clients. Thus, again assuming that U.S.-government contracts make up 80% of Lockheed's business, the U.S. government would receive 80% of the benefit of any credits allocated to the DiscOps Pool in the form of reduced contract costs. (*See* Wright ¶ 73-74; USX1009 at 154-55 (Reese Dep.).)

C. Lockheed's treatment of response costs for the Sites under the DOSA

To date, the DOSA and DiscOps Pool have functioned as intended. As to the three discontinued Sites in this case, Lockheed has incurred environmental response costs related to those Sites, allocated them to the DiscOps Pool, amortized them over five years, and passed them down to its business units for bidding and billing purposes. Because once individual costs enter the DiscOps Pool, they are not "tracked" or "followed" (as individual costs) down through the

[25] Beyond the U.S. government, Lockheed provides goods and services to other governmental and some commercial entities, including foreign governments, state governments, municipalities, institutions of higher education, and the United Parcel Service. (Trial Tr. at 1653-56 (Gatchel).)

business unit or specific contracts, it is impossible to identify or trace response costs for the Sites to any particular government contract. (*See* Mateer Decl. ¶ 13.) Nonetheless, it is clear that Lockheed has indirectly recovered, and continues to indirectly recover, response costs for the Sites from the U.S. government through the indirect costs charged to U.S.-government contracts. (Wright Decl. ¶ 57-59; USX407 at 4-5.) Indeed, Lockheed boasts that its "underlying tenet in pricing [its] contracts with the U.S. government" is its "ability to recover [its] costs . . . regardless of the type of contract." (USX407 at 4-5.)

As of December 31, 2013, Lockheed had indirectly recovered through its U.S.-government contracts more than $208 million – or 72% – of its estimated $287 million in total nominal response costs at the Sites. (Meyer Decl. ¶ 29 & fig. 5.)[26] In the future, this "effective government share" of response costs at the site is expected to rise because U.S.-government contracts will make up an even higher percentage of Lockheed's business than in the past. (*See* Trial Tr. 581 (Wright); Meyer Decl. ¶ 82 & fig. 30; USX 402.0002.) Indeed, in the past few years, Lockheed's recovery rate through U.S.-government contracts has been approximately 87% (Wright Decl. ¶ 66), and it is predicted that this recovery rate will continue to fluctuate around that percentage in the near future. (*See* Trial Tr. 591-93 (Wright); USX 402.0002.) Accounting for the increase in Lockheed's U.S.-government contract base, and considering the projected future cleanup costs for the Sites, the government's expert economist estimates that Lockheed will ultimately indirectly recover through U.S.-government contracts nearly 83% of its total nominal response costs at the Sites. (Meyer Decl. ¶ 30 & fig. 6.)

[26] Lockheed also earned, and continues to earn, a profit factor on every dollar of response costs passed through to its contracts, U.S.-government or otherwise. (*See* Meyer Decl. ¶ 39; Wright Decl. ¶¶ 77, 83.) Thus, the higher the indirect costs charged to the DiscOps Pool, the more profit Lockheed earns from its clients. (*See* Wright Decl. ¶ 84.)

Aside from its indirect recovery of over 72% of its response costs for the Sites through U.S.-government contracts to date, Lockheed has also allocated as an indirect cost and subsequently recovered (though not through the DiscOps Pool) a substantial portion of its legal fees and costs associated with bringing this action. The government's expert economist estimates that Lockheed indirectly recovered through government contracts, in nominal dollars, over 85% of the $7.35 million in legal fees and costs it incurred between 2007 and 2012. (Meyer Decl. ¶¶ 163-75.) Lockheed incurred an additional $3.2 million in legal fees and costs through November 2013 (Gov't Closing Presentation [Dkt. No. 144] at 245), and undoubtedly, it has incurred several million dollars more in fees and costs for the extensive pretrial preparation and trial briefing since December 2013, the expert fees for the six experts who provided testimony at trial, and the fees and costs associated with the five counsel who attended a twelve-day trial. According to the government's expert economist, Lockheed will indirectly recover over 85% of its total legal fees and costs (presumably at least $10 million) through U.S.-government contracts. (*See* Meyer Decl. ¶ 172.)

IV. PROCEDURAL HISTORY

A. Related actions while the CERCLA statute of limitations was tolled

Lockheed did not bring this action for recovery of response costs under CERCLA until 2008, fourteen years after it began remediation efforts at the Redlands facility. The parties, through Lockheed's in-house counsel and attorneys within the Environmental and Natural Resources Division of the Department of Justice, agreed to a tolling of the CERCLA statute of limitations, *see* 42 U.S.C. § 9613(g)(2), beginning in 1997. (*See* PX1788, 1823, 1838, 1849, 2078.) These tolling agreements, specifically for the Redlands site, were in effect from January 27, 1997 to November 1, 2003. (PX 1788, 2078.) The parties renegotiated the agreements on a

semi-annual basis during this time period, including negotiating a one-year extension of the tolling agreement on July 10, 2000 (PX1849), less than two months before Lockheed and the DCMA entered into the DOSA on September 6, 2000. (USX1033 at 10.)

Although the DOSA addressed environmental cleanup costs, it did not purport to settle CERCLA liabilities between Lockheed and the government. To the contrary, the DOSA explicitly provides that it "does not settle any claims, if any, arising under CERCLA." (*Id.* ¶ 4.18.) Indeed, the DOSA implicitly recognized the potential coexistence of direct recoveries from the government under CERCLA and indirect recoveries from the government through costs charged to U.S.-government contracts. In particular, the parties devoted an entire section of the DOSA to the treatment of the January 20, 2000 Consent Decree signed by Lockheed and the Department of Justice in the *Burbank* CERCLA litigation.[27] (USX1033 ¶¶ 3.1-.5.) In the *Burbank* Consent Decree, the United States agreed to pay Lockheed directly for over forty-four percent of past response costs and for fifty percent of most future response costs for the site. (PX1844 ¶¶ 3.1-.6, 4.1-.3.) While the *Burbank* Consent Decree acknowledged that Lockheed was already allocating "certain environmental remediation costs" to its discontinued operations pool, it did not purport to "resolve[]" the "allowability and allocability of these costs." (*Id.* ¶ 2.14.) Nonetheless, the Consent Decree did specify that under no circumstance could the United States determine that the agreed-upon past costs were "not properly subject to payment under the terms of the Decree because the costs were previously reimbursed by the United States or

[27] The *Burbank* case arose when, in 1991, the United States sued Lockheed, among others, under CERCLA § 107(a) for the recovery of response costs associated with the cleanup of TCE at a former Lockheed aircraft and aeronautic production facility in Burbank, California. (PX1844 ¶¶ 2.1, 2.5.) The parties signed an initial consent decree in 1992 requiring Lockheed to operate a groundwater treatment plant at the Burbank facility and to reimburse the government for response costs it had incurred. (*Id.* ¶ 2.5.) In 1997, Lockheed filed a counterclaim against the government under CERCLA § 113(f), seeking contribution for its past and future response costs at the Burbank facility. (*Id.* ¶ 2.9.) The 2000 *Burbank* Consent Decree settled Lockheed's counterclaim against the United States.

another party through an overhead pool" like the discontinued operations pool. (*Id.* ¶ 3.16.) To counterbalance that provision, the Consent Decree required that "Lockheed Martin shall not realize a double recovery with regard to any" response costs and "shall credit its continued operations pool with amounts received from the United States pursuant to this Decree in accordance with an agreement of Lockheed Martin and the United States." (*Id.* ¶ 3.25.) The "agreement" encompassed the DOSA, wherein the parties agreed to disallow $80.6 million in costs related to the Burbank site and disallow $29 million in credits paid to Lockheed by the United States pursuant to the *Burbank* Consent Decree. (USX1033 ¶¶ 3.1-.3.)

During the tolling period, Lockheed was involved in several related matters. In 1993, a group of insurers sued Lockheed in state court in California, seeking a declaration that they were not required to defend or indemnify Lockheed for the costs of environmental remediation at multiple sites, including the Redlands facility. *Procter v. Lockheed Corp.*, Case No. 731752, Complaint (Cal. Sup. Ct. May 27, 1993) (PX2070). The trial court ruled for the insurers, holding, *inter alia*, that Lockheed's indirect recovery of response costs through government contracts triggered the "government reimbursement exclusion" contained in the policies, and thus, the insurers were not required to defend or indemnify Lockheed. *Procter v. Lockheed Corp.*, Case No. 731752, Statement of Decision Re: Phase II at 65-79 (Cal. Sup. Ct. Oct. 27, 2003) (PX2073). Prior to the entry of judgment, Lockheed sought declaratory relief in federal court to enjoin the state court's preliminary ruling. In that action, the government filed an application to intervene in support of Lockheed's position that indirect payments for response costs through government contracts does not reduce or eliminate insurance coverage under the government reimbursement exclusion. (PX2069 ¶¶ 25-26 (Porterfield Decl.).) The federal court dismissed Lockheed's action for lack of subject matter jurisdiction, and the state court entered

final judgment on October 22, 2003. (*Id.* ¶¶ 27-28.) Lockheed immediately appealed, and on November 22, 2005, the California Court of Appeal affirmed the trial court's decision. *See Lockheed Corp. v. Cont'l Ins. Co.*, 35 Cal. Rptr. 3d 799 (Cal. Ct. App. 2005). The Supreme Court of California denied Lockheed's petition for review on March 22, 2006, and the parties subsequently entered into a confidential settlement agreement whereby the insurers "bought back" the disputed policies. (Trial Tr. at 479 (Lockheed counsel); PX2069 ¶ 31 (Porterfield Decl.); PX2075-76.) The proceeds from that agreement were credited to the DiscOps Pool. (Trial Tr. at 1455-56 (Lockheed counsel).)

In 1995, Lockheed sued Seven W Enterprises, which at the time operated a manufacturing facility on a portion of the Redlands facility, for recovery of response costs incurred for the Redlands TCE plume. *See Lockheed Martin Corp. v. Seven W Enterprises*, 95-cv-6153, Complaint (C.D. Cal. Sept. 14, 1995). Pursuant to a confidential settlement in late 1996, Lockheed indemnified Seven W from future liability in exchange for a lump sum payment. Lockheed credited the amount recovered under this confidential agreement to the DiscOps Pool. (Trial Tr. at 476-77 (Lockheed counsel).)

That same year, a group of plaintiffs filed a toxic tort class action suit against Lockheed seeking medical monitoring costs and punitive damages based on the contamination of drinking water from the Redlands TCE plume. *See Lockheed Martin Corp. v. Superior Court*, 63 P.3d 913, 916 (2003). The California Court of Appeal reversed the trial court's class certification and, in 2003, the Supreme Court of California affirmed. *Id.* at 922. The case settled some ten years later, while the second bellwether group of plaintiffs was seeking class certification. (Trial Tr. at 372-73 (Lockheed counsel).) Under the DOSA, Lockheed's payments pursuant to its

confidential settlement of the toxic tort action are specifically allowable as indirect costs charged to the DiscOps Pool. (USX1033 ¶1.8.)

Finally, in 2004, Lockheed – sponsored by The Boeing Company – pursued an appeal under the Contracts Dispute Act, 41 U.S.C. § 7101 *et seq.*, to the Armed Services Board of Contract Appeals ("ASBCA") seeking indemnification from the government for response costs and toxic tort liabilities at the Sites arising out of LPC's performance of SRAM production contracts from 1971 to 1975. *See generally In re Boeing Co.*, ASBCA No. 54853, 06-1 BCA ¶ 33,270 (Apr. 12, 2006).[28] Lockheed sought indemnification under provisions in its SRAM production subcontracts that provided for government indemnification for certain claims or losses resulting from "unusually hazardous" risks. *See id.* After several rulings on cross-motions for partial summary judgment, *see, e.g.*, *Appeal of the Boeing Co.*, ASBCA No. 54853, 11-2 B.C.A. ¶ 34,813 (July 28, 2011), the parties filed summary judgment briefs on whether environmental response costs arising out of LPC's solid propellant rocket motor production were "unusually hazardous risks." (Trial Tr. at 374-75 (government counsel).) On April 15, 2013, after the toxic tort settlement and before the ASBCA could rule on those motions, Lockheed (through Boeing) voluntarily dismissed its appeal with prejudice. (USX74.)

B. The government's partial motion for summary judgment

Meanwhile, after over fourteen years of cleanup actions at the Redlands facility, on July 1, 2008, Lockheed brought this action against the United States under CERCLA § 107(a). The government filed a counterclaim against Lockheed under CERCLA § 113(f) seeking, to the extent it was a PRP, equitable allocation of response costs between the parties.

[28] Boeing sponsored LPC's claim because Boeing was the prime contractor for the SRAM production contracts. (Trial Tr. at 371 (Lockheed counsel).)

Several months later, the government moved for a partial summary judgment on the ground that Lockheed could not recover under CERCLA § 107(a) those response costs for the Sites that it had already recovered through indirect costs charged to the DiscOps and passed through to government contracts. (Mot. for Partial Summ. J., Jan. 9, 2009 [Dkt. No. 25-2] at 10.) The government contended that Lockheed's recovery of costs under CERCLA, for which the government-as-client (primarily the DOD) had already indirectly paid pursuant to the DOSA, would result in a double recovery – a violation of both the DOSA and CERCLA. *See* 42 U.S.C. § 9614(b).

On September 29, 2009, Judge Robertson rejected the government's legal arguments on several grounds. *See Lockheed Martin Corp. v. United States*, 664 F. Supp. 2d 14 (D.D.C. 2009). Judge Robertson first distinguished the bar on double recovery in CERCLA § 114(b) from the present case. Section 114(b) states that "[a]ny person who receives compensation for removal costs or damages or claims pursuant to any other Federal or State law shall be precluded from receiving compensation for the same removal costs or damages or claims as provided in [CERCLA]." 42 U.S.C. § 9614(b). Judge Robertson faulted the government's argument for failing appreciate the distinction between the "government-as-client" and the "government-as-PRP." To Judge Robertson, the government-as-client's indirect cost payments under government contracts were not "compensation" for the government's liability in the same manner as direct payments from an insurer, private PRP, or government PRP. *Lockheed Martin Corp.*, 664 F. Supp. 2d at 19. Judge Robertson further noted that the DOSA "explicitly states that it 'does *not* settle claims, if any, arising under CERCLA.'" *Id.*

Judge Robertson also distinguished the double recovery cases cited by the government. In those cases, plaintiffs sought to recover response costs which they had already recovered from

other PRPs (through settlement or state-law versions of CERCLA) or response costs which their insurers had paid for directly. *Id.* The courts in those cases applied CERCLA section 114(b) in order to prevent plaintiffs from receiving "a windfall from its environmental cleanup." *Id.* Judge Robertson concluded that there would be "no windfall" in this case because Lockheed was required under both the DOSA and the FAR to credit any CERCLA recovery from the government to the DiscOps Pool. *Id.* at 19-20. Thus, "any CERCLA recovery from the government would lead to a commensurate reduction in the [DiscOps Pool] that Lockheed could charge as indirect costs on its government contracts. From a monetary standpoint, Lockheed would be back where it started." *Id.* at 19.

Judge Robertson also emphasized the "important implications for both parties" – Lockheed would "improve its competitive position" and the government-as-client would benefit from decreased contract prices. *Id.* at 20. Accordingly, Judge Robertson concluded:

> If Lockheed is only partially liable for the response costs it is incurring at the Site, it should not have to include all its response costs in the [DiscOps] Pool. The ruling on the instant motions ensures that Lockheed may recover separately under CERCLA from the government-as-PRP (if the suit ends with a recovery), burdened in its dealings with the government-as-client only by those costs for which it is actually liable.

Id.

On October 22, 2009, the government moved for reconsideration, *inter alia*, on the grounds that Judge Robertson improperly imported requirements, such as the potential for "windfall," into the language of CERCLA § 114(b) and failed to address the argument that Lockheed's indirect recovery of response costs through government contracts could be considered as an equitable factor during allocation of response costs under CERCLA § 113(f)(1). (Mot. for Reconsideration, Oct. 22, 2009 [Dkt. No. 39] at 2-3.)

Judge Robertson denied the motion on February 18, 2010. (Mem. Order, Feb. 18, 2010 [Dkt. No. 43] at 2-3.) While remaining steadfast in his denial of summary judgment, Judge Robertson acknowledged that some of the government's positions, "including those about the equitable considerations under Section 113(f)(1) and burden to taxpayers, may be relevant to allocation determinations that might lie ahead in this litigation." (*Id.* at 3.)[29] Judge Robertson therefore left open the door to the equitable double recovery and taxpayer burden arguments that are now at the center of the allocation phase of the case.[30]

C. Trial on equitable allocation

The parties engaged in extensive factual and expert discovery over the next four years. On September 26, 2013, the Court bifurcated the pending trial into two phases: (1) the parties' liability as PRPs under CERCLA § 107(a) and the equitable allocation of response costs under CERCLA § 113(f); and (2) the "accurate accounting" of response costs. (Order, Sept. 26, 2013 [Dkt. No. 97] at 2.) The Court scheduled a two-week bench trial for Phase I to begin on February 10, 2014. (*Id.*)

Leading up to the trial, the parties stipulated that they were both PRPs liable under CERCLA § 107(a) for the response costs that Lockheed had incurred at the Sites and that the Court should allocate liability for the response costs between them according to equitable principles under CERCLA § 113(f)(1). (Stipulation on Liability, Dec. 20, 2013 [Dkt. No. 103] at 2-3.) The parties also stipulated that, as required under CERCLA, Lockheed had incurred at least one dollar of "necessary costs of response" at the Sites in a manner "consistent with the

[29] In *Raytheon* (cited *supra* n. 21), the government raised an affirmative defense analogous to that rejected by Judge Robertson in this case. 2007 WL 4300221, at *2-3. As Judge Robertson did, the judge in *Raytheon* concluded that Raytheon's indirect recovery of response costs through U.S.-government contracts could be considered as an equitable matter. *Id.* at *3. However, as noted, the *Raytheon* case settled before the issue of allocation was reached.

[30] Following Judge Robertson's retirement, the case was reassigned to this Court on June 3, 2010.

National Contingency Plan." (Stipulation on Response Costs, Dec. 20, 2013 [Dkt. No. 104] at 1-2 (quoting 42 U.S.C. § 9607(a)(4)(B)).)

Given the stipulations on liability, the Phase I bench trial concerned only the equitable allocation of liability under CERCLA § 113(f)(1). The Court presided over the Phase I bench trial over twelve days beginning February 10 and ending on March 14, 2014. Through no fault of the parties or their counsel, the evidence at the trial was both voluminous and inconclusive in many significant respects. Arguably, the most useful testimony came from the only two witnesses who had been on the ground during LPC's operations at the Sites, but even those witnesses had limited recollections. (*See, e.g.*, Trial Tr. at 95 (Oppliger); *id.* at 1374 (Dull).) Otherwise, the record suffered from the many shortcomings inherent in CERCLA actions: hundreds of missing contracts[31] and significant gaps in the documents; a lack of contemporaneous accounts of waste disposal operations at the Sites; almost no fact witnesses, thus requiring extensive reliance on "historic" depositions, themselves taken some twenty to thirty years after operations at the Sites; and contamination that, at least at the Redlands facility, had migrated miles from the location of original disposals. In view of these evidentiary constraints, the parties understandably relied almost exclusively on experts. The experts, who provided direct testimony by declaration and were subject to cross examination and redirect at trial, predictably presented diametrically opposed opinions regarding almost every important subject, often relying on assumptions that were not sufficiently provable for the Court to draw any reliable conclusions.

[31] Out of the estimated hundreds or thousands of contracts relevant to this action, Lockheed's contracting expert had reviewed "perhaps three" and could not confirm that any contract he had reviewed was actually complete. (Trial Tr. at 148-49 (Johnson).) Without contracts themselves, the experts had to rely on Master Project Orders and documentation of contract revisions to attempt to piece together the "very limited database" of contracts available in this case. (*Id.* at 149.)

The testimony and evidence presented at trial addressed five somewhat-overlapping issues, and as could be expected, on each issue save one, the Court had a battle of the experts. First, Dr. Peter Roman, Lockheed's expert historian, provided a mostly undisputed account of the history of the solid rocket propellant industry and LPC's government contracts. Second, the parties presented evidence of the degree of government activity at and control over the Sites with respect to government specifications, safety manuals, project reviews, and safety inspections. Each party also called a fact witness to describe the government's presence at the Sites. Mr. Gerald Oppliger testified about his experiences working as an engineering analyst for LPC designing rockets for several government contracts, including SRAM, from 1962 to 1971. (Trial Tr. at 74-77 (Oppliger).) Mr. Peter Dull testified about his work on SRAM as a propulsion engineer for the SPO from the program's inception to Lockheed's delivery of the rockets. (*Id.* at 1337-38 (Dull).) Third, the parties put on dueling experts relating to the subject of government contracting – Mr. Richard Johnson (for Lockheed) and Mr. James Nagel (for the government) – who provided opinions on whether and to what extent the government, through contracting regulations, owned the TCE and AP at the Sites.

Fourth, the parties spent an excessively large amount of trial time on the issues of contamination and, in particular, which of LPC's activities caused it. Lockheed called Thomas Blackman to provide foundational testimony regarding the contamination and response actions at the Redlands facility. Both parties then put on multiple experts. Lockheed's primary expert, Dr. Stanley Feenstra, a hydrogeologist, opined on the probable sources of TCE (vapor degreaser) and perchlorate contamination (burn pits) at the Sites and the level of care with which LPC handled its solvent and propellant wastes. Dr. Tod Delaney, an environmental engineer, provided a rebuttal opinion to the government expert opinion from Thomas Cain, a chemical and process

engineer, regarding the sources of perchlorate contamination from the southern half of the Redlands facility. The government's primary expert, Dr. Robert Sterrett, a hydrogeologist, opined primarily on probable sources of TCE (employee dumping) and perchlorate contamination (burn pits and grinder part washing) at the Sites, while Mr. David Bauer, a chemist, opined on the level of care with which LPC handled its solvent and propellant wastes. The government also called Ms. Mary Sitton as an aerial photography expert who analyzed historical aerial photographs of the Sites for evidence of sources of pollution. Of the myriad, though incomplete, sources available to them, the experts relied primarily on LPC's process specifications, engineering diagrams of buildings and equipment, and the historic deposition testimony of dozens of former LPC workers. The experts also relied on their own personal experiences and general industrial and military practices at the time. Nonetheless, the ultimate expert opinions often amounted to no more than exercises in reasoned speculation.

Finally, the parties spent a significant amount of trial on the accounting and economic issues that make this case unique. Lockheed called Mr. Robert Gatchel, Lockheed's current vice president of government finance, to describe the implementation of the DOSA and Lockheed's government contracting procedures. Each party also called two experts to address the DOSA, double recovery, and Lockheed's economic benefit from a CERCLA recovery in this case. For the government, Mr. Wiley Wright opined on the general function of DOSA, and Dr. Joan Meyer presented an economic model demonstrating the benefit to Lockheed from various CERCLA recovery scenarios. Lockheed's experts, Mr. Mark Kiefer and Mr. Rodney Mateer, criticized the assumptions and methodologies of the government experts, but provided no competing economic model to substantiate their position that Lockheed would not economically benefit from a CERCLA recovery in this case.

The difficulty of an incomplete record and heavy reliance on expert testimony was compounded by the lack of analogous CERCLA cases.[32] While many CERCLA actions have been brought by government contractors against the U.S. government, only a few appear to have reached the allocation stage. And none of those address the key issue in this case: whether the fact that the government contractor has been indirectly recovering its response costs from the U.S. government-as-client through U.S.-government contracts should, as an equitable consideration, reduce its recovery from the U.S. government-as-PRP under CERCLA.

LEGAL FRAMEWORK

Congress enacted CERCLA "in response to the serious environmental and health risks posed by industrial pollution." *United States v. Bestfoods*, 524 U.S. 51, 55 (1998). The statute "was designed to promote the timely cleanup of hazardous waste sites and to ensure that the costs of such cleanup efforts were borne by those responsible for the contamination." *Burlington N. & Santa Fe Ry. Co. v. United States*, 556 U.S. 599, 602 (2009) (internal quotation marks omitted). By requiring responsible parties to pay for cleanup efforts, CERCLA also ensures that "the taxpayers [are] not required to shoulder the financial burden of a nationwide cleanup." *B.F. Goodrich Co. v. Murtha*, 958 F.2d 1192, 1198 (2d Cir. 1992).

In furtherance of these goals, CERCLA allows private parties to recover the costs of cleaning up hazardous wastes from several broad categories of PRPs. 42 U.S.C. § 9607(a)(1)-(4).[33] Liability under these provisions is strict and, by default, joint and several. *PCS Nitrogen*

[32] At the Court's request, the parties filed several helpful memoranda on legal issues, including operator and arranger liability, equitable indemnification, double recovery, and prejudgment interest.

[33] A private-party plaintiff establishes a *prima facie* case for cost recovery under CERCLA by establishing that (1) the defendant is a PRP; (2) the site constitutes a "facility"; (3) a "release" or a threatened release of hazardous substances exists at the "facility"; (4) the plaintiff has incurred costs responding to the release or threatened release of hazardous substances ("response costs"); and (5) the response costs conform to the National Contingency Plan. *PCS Nitrogen Inc. v. Ashley II of Charleston*

Inc. v. Ashley II of Charleston LLC, 714 F.3d 161, 168 (4th Cir. 2013). Relevant to this action, PRPs include any past "owner" or "operator" and any "arranger." *See* 42 U.S.C. § 9607(a)(2)-(3).[34]

Under CERCLA, a person is liable as a past "owner" or "operator" if he "at the time of disposal of any hazardous substance owned or operated any facility at which such hazardous substances were disposed of." *Id.* § 9607(a)(2). The phrase "owner or operator" is unhelpfully defined "only by tautology . . . as 'any person owning or operating' a facility." *Bestfoods*, 524 U.S. at 56 (quoting 42 U.S.C. § 9601(20)(A)(ii)). Courts consider "owner" and "operator" liabilities in the disjunctive. *Commander Oil Corp. v. Barlo Equip. Corp.*, 215 F.3d 321, 328 (2d Cir. 2000); *cf. Bestfoods*, 524 U.S. at 64. In this regard, past owner liability is fairly simple, and premised on the ownership, whether *de facto* or *de jure*, of a "'facility' at the time of the disposal of a hazardous substance." *PCS Nitrogen*, 714 F.3d at 172 (citing 42 U.S.C. § 9607(a)(2)); *see Commander Oil*, 215 F.3d at 331-32.[35] Notably, the ownership of the *hazardous substances* disposed of at a given facility is *irrelevant* to ownership liability. *See* 42 U.S.C. § 9607(a)(2).

LLC, 714 F.3d 161, 167-68 (4th Cir. 2013); *see also* 42 U.S.C. §§ 9601(9), (22), 9607(a). Each of these requirements is stipulated to or otherwise undisputed in this case. (*See* Stipulation on Liability, Dec. 20, 2013 [Dkt. No. 103]; Stipulation on Response Costs, Dec. 20, 2013 [Dkt. No. 104].)

[34] Because both parties have stipulated to liability under CERCLA § 107(a), the Court need not determine under which provision(s) each party falls. Nonetheless, the Court does find it useful to consider the breadth (and limits) of types of PRP liability when balancing the equities under CERCLA § 113(f).

[35] Under CERCLA, the term "facility" has two meanings. First, the term "facility" serves as a catch-all for almost any original source from which a disposal might have occurred. *See* 42 U.S.C. § 9601(9)(A) (defining "facility" as "any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft"). Second, the term "facility" includes "any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located." *Id.* § 9601(9)(B). Courts have interpreted this second meaning to cover, at a minimum, "'the bounds of the contamination.'" *See PCS Nitrogen*, 714 F.3d at 178 (quoting *United States v. Twp. of Brighton*, 153 F.3d 307, 313 (6th Cir. 1998)). Thus, "[t]here may be several 'facilities' at a site for purposes of CERCLA, including separately owned 'equipment'

Operator liability is more nuanced, but *Bestfoods* provides some helpful guidance. There, the Supreme Court clarified that when defining "operator" liability under CERCLA, Congress "obviously meant something more than mere mechanical activation of pumps and valves" and intended liability to extend to those who "exercise . . . direction over the facility's activities." 524 U.S. at 71. On this basis, the Court concluded that an operator under CERCLA must "manage, direct, or conduct operations specifically related to pollution, that is, operations having to do with the leakage or disposal of hazardous waste, or decisions about compliance with environmental regulations." *Id.* at 66-67. The definition of "operator" in *Bestfoods* "clearly requires actual participation, not merely the potential to do so." *City of Wichita, Kansas v. Trustees of APCO Oil Corp. Liquidating Trust*, 306 F. Supp. 2d 1040, 1054 (D. Kan. 2003); *see also United States v. Twp. of Brighton*, 153 F.3d 307, 314 (6th Cir. 1998) (describing *Bestfoods* as "highlight[ing] the importance of establishing some actual control by a putative operator"). Although "actual participation" in this sense "does not require a finding that the [defendant] directly participated in the day-to-day activities" at the facility, *see United States v. Kayser-Roth Corp.*, 103 F. Supp. 2d 74, 82 (D.R.I. 2000), *Bestfoods* requires that an operator "make the relevant decisions" regarding the disposal of hazardous wastes "on a frequent, typically day-to-day basis." *City of Wichita*, 306 F. Supp. 2d at 1055 (collecting cases).

Arranger liability generally "prevents owners of hazardous waste from avoiding liability under CERCLA by transferring ownership of the waste to another party for the purposes of disposal." *Wilson Rd. Dev. Corp. v. Fronabarger Concreters, Inc.*, -- F. Supp. 2d. ---, 2013 WL 4875071, at *6 (E.D. Mo. Sept. 11, 2013). CERCLA defines "arranger" as "any person who by

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within a larger facility," *Am. Int'l Specialty Lines Ins. Co. v. United States*, 2010 WL 2635768, at *21 (C.D. Cal. June 30, 2010), as well as the location where the contamination has migrated over time. In this regard, the "facilities" in this case include not only any historic sources of contamination at the Redlands, Potrero Canyon, and LaBorde Canyon properties, but also the area of the Redlands TCE and perchlorate plumes.

contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances owned or possessed by such person, by any other party or entity, at any facility or incineration vessel owned or operated by another party or entity and containing such hazardous substances." 42 U.S.C. § 9607(a)(3).

Arranger liability requires ownership or possession of hazardous substances, but "cannot be imposed on that basis alone." *Morton Int'l, Inc. v. A.E. Staley Mfg. Co.*, 343 F.3d 669, 679 (3d Cir. 2003).[36] Instead, as the Supreme Court clarified in *Burlington Northern*, "whether an entity is an arranger requires a fact-intensive inquiry that looks beyond the parties' characterization of the transaction as a 'disposal' or a 'sale' and seeks to discern whether the arrangement was one Congress intended to fall within the scope of CERCLA's strict-liability provisions." 556 U.S. at 610. Under the plain language of the statute, a person is *only* an arranger if he "plans for" or "takes intentional steps to dispose of a hazardous substance" he owned or possessed. *Id.* at 611. Accordingly, although knowledge that a hazardous substance will be disposed of "may provide evidence of the entity's intent to dispose of its hazardous wastes, knowledge alone is insufficient to prove that an entity 'planned for' the disposal, particularly when the disposal occurs as a peripheral result of a legitimate" transaction, such as the sale of a useful product. *Id.* at 612. Courts oftentimes consider – as with operator liability – a party's exercise of control over the disposal of hazardous substances as "a crucial element of the [fact-specific] determination of whether a party is an arranger." *See United States v. Shell Oil Co.*, 294 F.3d 1045, 1055 (9th Cir. 2002).

[36] *But see United States v. Iron Mountain Mines, Inc.*, 881 F. Supp. 1432, 1451 (E.D. Cal. 1995) (collecting cases where courts "impose[d] arranger liability on parties who did not literally own or physically possess hazardous wastes," but noting that "in each of these cases the party either was the source of the pollution or managed its disposal by the arranger.").

A plaintiff who is also a PRP theoretically may avoid CERCLA liability altogether by imposing joint and several liability on a PRP-defendant under CERCLA § 107(a). However, the PRP-defendant can "blunt any inequitable distribution of costs by filing a § 113(f) counterclaim" against the PRP-plaintiff. *United States v. Atl. Research Corp.*, 551 U.S. 128, 140 (2007). In such instances – as here – a court must determine the allocation of liabilities between the PRPs pursuant to CERCLA § 113(f)(1).

CERCLA § 113(f)(1) states that "[i]n resolving contribution claims, the court may allocate response costs among liable parties using such equitable factors as the court determines are appropriate." 42 U.S.C. § 9613(f)(1). Courts have universally held that "[t]his plain language grants a court significant discretion to choose which factors to consider in determining equitable allocation of liability." *PCS Nitrogen Inc.*, 714 F.3d at 186; *see also Boeing Co. v. Cascade Corp.*, 207 F.3d 1177, 1187 (9th Cir. 2000). "[I]n any given case, a court may consider several factors, a few factors, or only one determining factor . . . depending on the totality of circumstances presented to the court." *Envtl. Transp. Sys., Inc. v. ENSCO, Inc.*, 969 F.2d 503, 509 (7th Cir. 1992).

"Courts generally trot out two lists of factors when considering allocation under CERCLA." *Yankee Gas Servs. Co. v. UGI Utilities, Inc.*, 852 F. Supp. 2d 229, 247 (D. Conn. 2012). The first, the so-called "Gore Factors," find their source in the legislative history (and unsuccessful amendment) of CERCLA by then-Representative Al Gore. *See Boeing*, 207 F.3d at 1187. The "Gore Factors" include:

> [1.] the ability of the parties to demonstrate that their contribution to a discharge, release or disposal of a hazardous waste can be distinguished;
>
> [2.] the amount of the hazardous waste involved;
>
> [3.] the degree of toxicity of the hazardous waste involved;

> [4.] the degree of involvement by the parties in the generation, transportation, treatment, storage, or disposal of the hazardous waste;
>
> [5.] the degree of care exercised by the parties with respect to the hazardous waste concerned, taking into account the characteristics of such hazardous waste; and
>
> [6.] the degree of cooperation by the parties with Federal, State or local officials to prevent any harm to the public health or the environment.

Envtl. Transp. Sys., 969 F.2d at 508 (quoting *United States v. A & F Materials Co.*, 578 F. Supp. 1249, 1256 (S.D. Ill. 1984)).

Courts also often invoke the so-called "Torres Factors," named after the "critical factors" enumerated by then-Judge Torres:

> 1. The extent to which cleanup costs are attributable to wastes for which a party is responsible.
>
> 2. The party's level of culpability.
>
> 3. The degree to which the party benefitted from disposal of the waste.
>
> 4. The party's ability to pay its share of the cost.

United States v. Davis, 31 F.Supp.2d 45, 63 (D.R.I. 1998).[37]

Given the broad discretion granted in CERCLA § 113(f)(1), courts also look beyond the Gore and Torres factors when equitably allocating response costs. *See, e.g., Am. Int'l Specialty Lines Ins. Co. v. United States* (*AISLIC II*), 2013 WL 135405, at *9 (C.D. Cal. Jan. 9, 2013). Of relevance to this case, courts have also considered the following factors under CERCLA § 113(f)(1):

[37] Some scholars have argued that while "[t]he Gore factors are most relevant in academic and theoretical analysis of the way Superfund liabilities *should* be allocated. . . . in the real world Judge Torres' list of four critical factors often provides the basis upon which Superfund allocations are made." Robert P. Dahlquist, *Making Sense of Superfund Allocation Decisions: The Rough Justice of Negotiated and Litigated Allocations*, 31 ENVTL. L. REP. 11098, 11099 (2001) (emphasis added); *see also Yankee Gas*, 852 F. Supp. 2d at 247.

1. The "knowledge and/or acquiescence of the parties in the contaminating activities." *Weyerhaeuser Co. v. Koppers Co.*, 771 F.Supp. 1420, 1426 (D. Md. 1991).

2. The value of the contamination-causing activities to furthering the government's national defense efforts. *Cadillac Fairview/Cal., Inc. v. Dow Chemical Co.*, 299 F.3d 1019, 1026 (9th Cir. 2002); *Shell Oil*, 294 F.3d at 1060.

3. The existence of an indemnification agreement demonstrating "the parties' parties' intent to allocate liability among themselves." *Halliburton Energy Servs., Inc. v. NL Indus.*, 648 F. Supp. 2d 840, 863 (S.D. Tex. 2009); *see also Beazer E., Inc. v. Mead Corp.*, 412 F.3d 429, 447 (3d Cir. 2005).

4. "The financial benefit that a party may gain from remediation of a site." *Litgo New Jersey, Inc. v. Martin*, 2011 WL 65933, at *9 (D.N.J. Jan. 7, 2011); *see also City of Wichita*, 306 F. Supp. 2d at 1101.

5. The potential for windfall "double recoveries" by a plaintiff. *See, e.g., Litgo N.J. Inc. v. Comm'r N.J. Dep't of Envtl. Prot.*, 725 F.3d 369, 391 (3d Cir. 2013); *Friedland v. TIC-The Indus. Co.*, 566 F.3d 1203, 1207 (10th Cir. 2009).

6. The potential that a plaintiff might "make a profit on the contamination" at the expense of another PRP. *See Vine St., LLC v. Keeling ex rel. Estate of Keeling*, 460 F. Supp. 2d 728, 765 (E.D. Tex. 2006).

7. CERCLA's intent that "'responsible parties, *rather than taxpayers,* bear the costs'" of cleanup. *Yankee Gas*, 852 F. Supp. 2d at 256 (quoting *Marsh v. Rosenbloom*, 499 F.3d 165, 182 (2d Cir. 2007) (emphasis added)).

With these factors in mind, the Court now turns to the ultimate question before it: the equitable allocation between Lockheed and the government of past and future response costs at the Sites.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

To reach an equitable allocation for the Sites, the Court proceeds in three steps. First, the Court determines, to the extent possible, the sources of contamination at the Sites. From there, the Court bifurcates its equitable allocation analysis to consider (1) the familiar exercise of allocating response costs among parties and (2) the novel issue of whether Lockheed's indirect

recovery of those response costs through U.S-government contracts should affect the otherwise-equitable allocation.

I. SOURCES OF CONTAMINATION AT THE SITES

Although in many cases courts can find that a particular facility, party, or disposal action was responsible for a specific proportion of contamination at a site, *see, e.g., AlliedSignal, Inc. v. Amcast Int'l Corp.*, 177 F. Supp. 2d 713, 724 (S.D. Ohio 2001), the Court is unable to do so here given the gaping holes in the record. Instead, the Court must limit itself to determining the probable sources of perchlorate and TCE contamination at the three Sites.

A. Redlands facility

1. Perchlorate

The parties agree that a significant proportion of the perchlorate contamination in the Redlands perchlorate plume originated from the burning of propellant wastes in the burn pits in the northern portion of the Redlands facility. (Feenstra Decl. ¶¶ 123, 127; Sterrett Decl. ¶¶ 17, 136-41.) As described by Dr. Sterrett, the "burn pits were essentially trenches dug in the bare ground." (Sterrett Decl. ¶ 136.) LPC employees burned propellant wastes, containing waste AP in liquid and solid form, on a daily basis. (USX963.0086 (Speer Decl.).)

The operation of the burn pits contributed perchlorate to the Redlands perchlorate plume because, unbeknownst to anyone at the time, the AP disposed of in the pits was not completely destroyed by burning. (Trial Tr. at 730 (Feenstra); *see* PX1224 at 10.) Any AP residue remaining in the pits after burning could dissolve in a solvent (including water) and infiltrate through the porous soil down into the groundwater. (*See* Feenstra Decl. ¶ 126; PX1224 at 10). Dissolution of residue AP occurred during rainfall events (Feenstra Decl. ¶ 126) and when LPC

operators "thoroughly soaked with water" the burn pits when used multiple times in a day. (*See* PX0007 § 1505(d) (1968 DOD Safety Manual).)

The presence of perchlorate in groundwater wells in the southern portion of the Redlands facility also suggests the existence of perchlorate sources unassociated with the burn pits. (Feenstra Decl. ¶¶ 122, 148, 153.) The parties vigorously dispute the southern source of the perchlorate at the facility. The Court finds that there were three probable sources.[38]

First, beginning as early as November 1958, liquid solvent and AP wastes drained onto the ground outside of Building 52, where LPC mixed propellants.[39] (Sterrett Decl. ¶¶ 146-47.) At that time, a pipe intended to connect Building 52 to Evaporation Pit 61 only "drained *toward*" the pit, even though LPC recognized that it "should be piped right into [the] pit." (USX43.0002 (emphasis in original).) An October 16, 1959 aerial photograph showed staining and liquid

[38] Contrary to Dr. Feenstra's opinion (Feenstra Decl. ¶¶ 148-49), neither fugitive dust from AP handling and processing nor leakage from evaporation pits were probable sources of perchlorate in the Redlands plume. While some fugitive dust inevitably escaped the grinding buildings at the Redlands facility – particularly in the 1950s (*see* USX1160.0006, .0012-14) prior to the installation of advanced baghouse technologies (*see* USX1117) – prevailing winds would have spread the light, small AP dust particles far and wide before they settled onto the ground. (Cain Decl. ¶¶ 45-47.) Spread so far, it is unlikely the AP dust, once settled and dissolved by rainfall, could develop a wetted pathway necessary to migrate through the soil to the groundwater. Similarly, there is no evidence that the evaporation pits at the Redlands facility ever leaked (Feenstra Decl. ¶ 150; *see also* Trial Tr. at 1252-53 (Sterrett)), nor any evidence that AP-laden wastewater from the "soaking out" of rocket motors in the evaporation pits was disposed of on the ground. (*See* Feenstra Decl. ¶ 152.)

Nor, contrary to Dr. Sterrett and Mr. Cain's opinion (Sterrett Decl. ¶¶ 142-44; Cain Decl. ¶¶ 108-15), was Building 114's settling basin a probable source of perchlorate in the Redlands plume. LPC used Building 114 as a propellant research laboratory from which it discharged approximately 2500 gallons of wastewater into a dedicated settling basin. (USX781.0001.) Each week during dry weather, LPC pumped the water out of the settling basin "to an underground drain (storm sewer) catch basin" that "traverse[d] . . . into an open swale." (*Id.*) From that point, the water ran "on open ground" and infiltrated "due to the great percolation ability of the soil." (*Id.*) Although LPC's research laboratory used AP (Trial Tr. at 1282-83 (Cain)), the effluent pumped from the settling basin was actually lower in total dissolved solids (which would include AP) than the average groundwater in the area. (*See id.* at 1256-58, 1261 (Sterrett).) Based on this conflicting evidence, the Court cannot conclude that Building 114 was a probable source of perchlorate for the Redlands plume.

[39] Because LPC used cyclohexane, and not TCE, as a solvent in Building 52 in the late 1950s (USX43.0002), there is no evidence that this unconnected pipe was a source of the Redlands TCE plume.

within a drainage channel consistent with drainage from Building 52 *toward* rather than into Evaporation Pit 61. (Sitton Decl. ¶ 34; USX670.) Although it is unclear precisely when LPC addressed the problem it first recognized in late 1958,[40] aerial photography confirms by at least April 1963 a pipe did connect Building 52 to Evaporation Pit 61. (*See* Trial Tr. at 1434 (Sitton).)

Second, AP-laden wastewater percolated into the ground outside of several buildings when LPC employees washed down the interiors of those buildings with hoses and failed to collect the water or otherwise direct it to evaporation pits. (Sterrett Decl. ¶¶ 148-53; Cain Decl. ¶ 102; *see* Feenstra Decl. ¶ 151.) LPC employees washed down the interiors of grinding buildings at the Redlands facility on a weekly basis. (*See* USX808.0022 (Building 77 Process Specification); USX873 at 126-27 (Caldwell Dep.); USX973 at 157-58 (Spencer Dep.).) LPC employees also washed down the interiors of the mixing buildings, although with less frequency. (USX895 at 103-05 (Eastman Dep.).) For the portions of those buildings that did not have drains, the AP-laden wastewater "ran out of the building" (*id.* at 101) and onto the ground (USX994 at 115-16 (White Dep.), where it percolated into the soil and ultimately into the groundwater. (Sterrett Decl. ¶ 153.)

The final – and most significant – source of perchlorate from the southern portion of the Redlands facility was the washing of AP off of grinder parts and dust collection bags into the south sump outside of Building 77. LPC operated Building 77 as an AP grinding facility. In 1962, LPC issued a manufacturing process standard – Standard 00COO5 – addressing cleanup procedures for oxidizer grinding operations at Building 77. (USX32.) The Process Standard instructed LPC employees after each grind to "flush[] with water" certain parts of the grinder "to remove contamination." (*Id.* at .0003.) The standard further specified that "[t]he flushing will

[40] A July 11, 1960 letter from LPC to the Los Angeles Ordnance District suggests that the unconnected pipe probably was addressed by that point. (*See* PX1046 at 2.)

be performed at the faucet and sump outside the lower level of Bldg. 77. *Do not use water inside the building*." (*Id.* (emphasis in original).) The same process was mandated for the washing of the AP dust collection bags. (*Id.*; *see also* USX807.0031-33.)

Based on this process standard, both parties agree that after 1962, LPC washed AP dust off of the grinder parts and bags *outside* of Building 77. However, the parties dispute into which of the sumps on the west side of Building 77 the AP-contaminated washwater flowed. Mr. Cain opined that LPC employees washed the grinder parts and bags on the concrete slab outside of Building 77 and the washwater flowed naturally into the *south* sump, where it then percolated into the ground through a drain or was pumped to the south to drain naturally on the bare ground downhill and away from Building 77. (Cain Decl. ¶¶ 50-59, 79; *see also* Sterrett Decl. ¶¶ 125-35.) In rebuttal, Mr. Delaney, Lockheed's expert, opined that LPC employees washed the parts directly over and into the *north* sump, which pumped the washwater to an evaporation pit. (Delaney Decl. ¶¶ 38-50; *see also* Feenstra Decl. ¶¶ 109-21.)

The Court credits Mr. Cain's opinion that the washwater from cleaning the grinder parts and bags flowed to the south sump and ultimately percolated into the soil and migrated to the groundwater. LPC's process standards provided no clear instructions on precisely *how* to wash the grinder parts and bags at the "at the faucet and sump" outside of Building 77 (*see* USX32 § 1.3),[41] and the record lacks any evidence on how the workers actually performed the task. Mr. Delaney opined that LPC employees must have washed the parts and bags directly over the 3-foot by 3-foot north sump because they would have known that washing the parts over concrete would have presented a fire and explosion hazard if the AP recrystallized before reaching the south sump. (Delaney Decl. ¶¶ 28, 43-44.) Although Mr. Delaney's concern has a scientific

[41] Generally, wastewater containing AP was to be treated the same as waste propellant. (*See, e.g.*, PX1023 § 6.31.1; PX1043 §100.6.5.)

basis (*cf.* Cain Decl. ¶ 49), he vastly overstates the safety consciousness of LPC's employees. Former employee Donald Eastman stated in a deposition that, when the workers washed AP-laden wastewater out of grinding buildings, there was no effort to contain the water because "it wasn't considered a problem." (USX895 at 101 (Eastman Dep.).) Likewise, the numerous other instances of employees ignoring LPC-established safety protocols (*see infra* I.A.2) undermine Mr. Delaney's suggestion that those same employees would develop at Building 77 their own, more burdensome, cleaning protocols in the name of safety. Ultimately, there is little evidence to support the conclusion that the workers would on a near-daily basis spend the time and effort to remove the heavy lid over the north sump and wash the parts and bags directly over that sump when they had available the much easier process of washing the parts and bags over the concrete pad and allowing the wastewater to flow naturally into the south sump. (*See* Trial Tr. at 1298-99 (Cain).)[42]

Moreover, two pieces of evidence support Mr. Cain's opinion that washwater from cleaning the grinder parts and bags flowed into the south sump. First, George Nelson White, a maintenance mechanic at LPC from 1961 to 1975, stated that when the south sump reached capacity, "it pumped the water up to the top of the dike out into the rocks. They're all oxidizers there." (USX994 at 116 (White Dep.).) Second, and perhaps most persuasively, an April 16, 1966 aerial photograph shows an area of staining or standing liquid at the end of the drainage channel down-gradient from the south sump fallout. (*See* Trial Tr. at 1412-13 (Sitton); Sitton

[42] When Building 77 and its sumps were constructed, the washing of grinder parts occurred *inside* the building. Because the top floor had an internal drain to the north sump and, ultimately, to an evaporation pit, releases of AP-laden washwater onto the ground were minimal in the early years. (*See* Trial Tr. at 1301 (Cain).) It was not until 1962, when, due to humidity concerns, LPC changed its process specification to disallow washing inside Building 77. (Trial Tr. at 1300 (Cain); *see also* USX32 § 1.3).)

Decl. ¶ 41; USX672.)[43] Because there had been no precipitation in the fifteen days prior to the photograph (Sitton Decl. ¶ 42), the south sump would have only filled up and pumped water to the outfall if LPC employees were washing grinder parts and bags into the south sump.

Based on this evidence, the Court finds that AP-laden washwater from LPC employees' regular washing of grinder parts and bags outside of a Building 77 flowed into the south sump and contributed significantly to the Redlands perchlorate plume.[44]

2. Trichloroethylene

The parties disagree vehemently as to the identity of the source of the Redlands TCE plume. The government argues that the TCE originated primarily from LPC employees' intentional dumping of solvents onto the bare ground at various locations at the Redlands facility. (Trial Tr. at 897-98 (gov't opening); Sterrett Decl. ¶¶ 54-75.) In contrast, Lockheed asserts that the TCE primarily originated from discharges from a solvent-water separator attached to the vapor degreaser in Building 91. (Trial Tr. at 42-43 (Lockheed opening); Feenstra Decl. ¶¶ 63-95.)[45] Having considered the evidence on these sources, the Court finds that both probably contributed substantially to the Redlands TCE plume.

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[43] Lockheed suggested, based on an engineering drawing of Building 77 (PX837), that the water from the south sump flowed *northeast*, rather than *southwest*, and thus the staining or standing liquid Ms. Sitton identified could not have originated in the south sump. (*See* Trial Tr. at 1410 (Sitton).) However, close inspection of the engineering drawing reveals that the "existing drainage" flowing to the northeast had been "close[d] off" by the construction of a dyke. (PX837.) With the "existing drainage" to the northeast closed off, the "sump drains over [the] dyke" (*id.*) to the southwest, consistent with Ms. Sitton's analysis of the aerial photography and the general topography at the Redlands facility.

[44] Mr. Cain estimated that up to 20,000 pounds of the between 40,000 and 60,000 pounds of perchlorate in the Redlands plume may have originated from the washing of AP dust collection bags at Building 77. (Cain Decl. ¶ 92; *see* Sterrett Decl. ¶ 51.) The Court finds it unnecessary to decide on the validity of his estimations; it suffices to say that the washing of grinder parts and bags outside of Building 77 contributed significantly to the Redlands perchlorate plume and thus cleanup costs at the Redlands facility.

[45] Although in his declaration Dr. Sterrett opined that TCE could have leaked into the ground through cracks in the evaporation pits (Sterrett Decl. ¶ 78), he admitted on cross-examination that he had

First, the Court finds ample evidence that LPC employees poured TCE on the bare ground and that those actions were a probable source of the Redlands TCE plume. (*See* Sterrett Decl. ¶ 54.) Repeated pouring of small amounts of a liquid onto a porous and permeable soil can create a "wetted pathway" by which a liquid's chance of evaporation in the soil strata decreases and newly dumped liquids move quickly and easily to groundwater. (Trial Tr. at 829 (Feenstra); Sterrett Decl. ¶ 60.) The record is replete with credible historic depositions from LPC employees admitting to frequently pouring TCE and other solvents on the bare ground in contravention of company policy. (*See* PX961.) For example, Earl Wessman, a maintenance mechanic at the Redlands facility from 1963 to 1975, testified that he dumped a quart to two gallons of TCE daily at the same "very porous" bed of gravel north of Building 119, where the TCE would "sink right in." (USX989 at 188-90 (Wessman Dep.); USX990 at 419-420 (Wessman Dep.); *see also* USX987 at 15-17 (Wessman Test.).) Likewise, Christian Mulder, a night shift operator at the Redlands facility from 1956 to 1965, testified that he and his colleagues dumped one to two gallons of TCE on the ground outside Buildings 8 and 12 "just about every night." (USX941 at 34-35, 46-47 (Mulder Dep.).) Although Mulder and his colleagues knew of the availability of a nearby evaporation pit for solvent disposal, they refused to walk there at night for fear of the "rattlesnakes and tarantulas." Instead, they poured the waste TCE on the ground. (*Id.* at 86-87.)

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no evidence that cracks existed in the evaporation pits at the Redlands facility. (*See* Trial Tr. at 1252-53 (Sterrett).)

The parties' experts also dispute whether burn pits were a minor source for the Redlands TCE plume. (*Compare* Feenstra Decl. ¶¶ 40-46, *with* Sterrett Decl. ¶¶ 70-73.) Although LPC employees poured small amounts of TCE directly into the burn pit at the Redlands facility (*see* USX944A.0002 (Nunes Decl.)), there is no evidence of TCE in the soil gas surrounding the burn pits. (*See* USX818.) Thus, the Court credits Dr. Feenstra's conclusion that the burn pits at the Redlands facility were not a probable source of any sizable amount of TCE in the Redlands plume.

Several other LPC employees also admitted to intermittent pouring of TCE on the bare ground at Redlands. (*See* Sterrett Decl. ¶¶ 68-72; USX944A.0002 (Nunes Decl.).)[46]

However, recognizing that some of the TCE poured onto the ground would have evaporated before it could percolate into the soil (Trial Tr. at 820 (Feenstra)) and that LPC shifted from using TCE to TCA as its preferred solvent in the mid-1960s (USX847 at 246-49 (Borgelt Dep.)), the Court concludes that it is improbable that LPC employee's pouring of TCE on the ground could account for the entirety of the Redlands TCE plume.

Instead, some portion of the TCE in the Redlands plume probably originated in the vapor degreaser in Building 91. Vapor degreasers are used to clean grease and oil off of metal instruments. Heating elements in the bottom of a vapor degreaser boil a "solvent liquid to produce a zone of hot solvent vapor." (Feenstra Decl. ¶ 64.) When degreaser operators place cold metal parts into the vapor zone, either in a basket or on a chain, the vaporized solvent condenses on and cleans the part. The "soiled" liquid solvent drips back down into the degreaser sump, where it is reheated into a vapor. (*Id.* ¶ 65.) Solvent vapors that do not condense on the metal parts are condensed by cooling coils on the perimeter of the degreaser tank. This condensed liquid collects and is directed to a solvent-water separator. When functioning properly, the solvent-water separator separates water that had condensed with the solvent from the solvent and directs the solvent back into the main degreaser tank to revaporize. (*Id.* ¶¶ 64, 81.) Any condensed water will float and, once it reaches a certain level, it is released via a drain onto the floor. (Trial Tr. at 833 (Feenstra).)

[46] Dr. Feenstra questioned whether the employees could recall which solvent they had poured on the ground decades before, or if, at the time of disposal, they could have distinguished between TCE and TCA. (*See* Feenstra Decl. ¶ 32.) The Court finds Dr. Feenstra's opinion in tension with Mr. Oppliger's testimony that LPC was a "very unique company" with a "lot of highly educated" and "attentive [and] detail-oriented type people" (Trial Tr. at 85-86 (Oppliger)), and therefore, it credits the LPC employees' identification of the solvents they dumped on the bare ground. (*See* Sterrett ¶¶ 58, 66.)

LPC operated the vapor degreaser in Building 91 to degrease rocket motor casings and other large components. (*See* Feenstra Decl. ¶ 23.) Dr. Feenstra opined that the solvent-water separator in the degreaser functioned improperly and released one-to-two gallons of watered-downed or even pure TCE per day onto the floor of Building 91, which then flowed through a drain directly into the subsurface soils. (*Id.* ¶¶ 76, 85-87; Trial Tr. at 817 (Feenstra); PX841 (diagram showing drain below vapor degreaser).).

The Court credits Dr. Feenstra's theory. Vapor degreasers (and their solvent-water separators) are common sources of solvent contamination at industrial and dry cleaning sites and can release pure solvent into the environment. (Feenstra Decl. ¶ 84.) That there is no evidence that any LPC employees noticed releases of small amounts of TCE from the solvent-water separator is not surprising, considering the substantial TCE odor associated with the operation of the degreaser, which was capable of boiling 120 gallons of TCE at a time, and the fact that solvent-water separators release water onto the floor when functioning properly. (Trial Tr. at 685 (Feenstra).)

However, there is little evidence to support Dr. Feenstra's opinion that the vapor degreaser was the *sole* source of TCE in the Redlands plume. First, Dr. Feenstra's opinion that the solvent-water separator released exclusively *pure* TCE throughout LPC's operations at the Redlands facility lacks convincing support in the record. (Trial Tr. at 1185 (Sterrett); Sterrett Decl. ¶ 109.) Second, the evidence indicates that LPC did not operate the vapor degreaser every day or "with any great frequency." (USX951 at 61 (Rodgers Dep.); USX995 at 117 (White Dep.).) And finally, contrary to Dr. Feenstra's opinion and Lockheed's arguments, the Court finds, based on Lockheed's sworn statements in *prior* legal and administrative actions, that LPC

switched from using TCE to TCA in the vapor degreaser "about late 1966 or early 1967."[47] (USX22.0012-13 (Lockheed interrogatory responses in Seven W litigation); *see also* USX120.0007-09 (response to request for information from California Department of Toxic Substances Control).) Thus, while the Court credits Dr. Feenstra's opinion that the solvent-water separator on the vapor degreaser in Building 91 is a probable source of a significant portion of the Redlands TCE plume, it is improbable that, as Dr. Feenstra opines, the vapor degreaser was the only source. (*See* Feenstra Decl. ¶ 92.)[48]

B. Potrero Canyon facility

As described above, the sources of perchlorate contamination in the soil and groundwater at the Potrero Canyon facility are undisputed. (*See* Trial Tr. at 1238-39 (Lockheed and government counsel).) A primary source of contamination for both soil and groundwater is the Burn Pit Area. (Sterrett ¶¶ 220-21, 226-27.) Some of the perchlorate contamination at the Potrero Canyon Burn Pit Area, like at the Redlands facility, resulted from the fact that a burn event would not completely destroy all of the AP, and some of the remaining AP residue

[47] Lockheed attempted to disassociate itself from its prior sworn representations by arguing that the representations were made "very early in [its] fact development." (Trial Tr. at 1731-32 (Lockheed closing).) The Court rejects Lockheed's attempt to play fast-and-loose with its prior and at-the-time-advantageous sworn representations regarding the switch from TCE to TCA in the vapor degreaser, especially since Lockheed's past position is corroborated by Larry Borgelt, who was a safety engineer for LPC from 1966 to 1974. (*See* USX841 at 251-52 (Borgelt Dep.).)

[48] The Court also concludes that the contribution, if any, of TCE from the Norton Air Force Base TCE plume into the Redlands TCE plume is of no consequence. The map relied on by Dr. Feenstra that showed the Norton and Redlands TCE plumes overlapping (*see* PX1972) demarcated the plumes using TCE concentrations of 0.5 µg/L, ten times lower than California's current maximum contaminant level for TCE of 5 µg/L. (Sterrett Decl. ¶¶ 165, 209; *see also* Trial Tr. at 648-50 (Feenstra).) The two plumes do not currently overlap at TCE concentration levels requiring cleanup, and to the extent that they overlap, the commingling will not cause the TCE concentration in the Redlands TCE plume to increase above the maximum contaminant level. (Trial Tr. at 653-54 (Feenstra).) Moreover, Lockheed failed to demonstrate that contributions from the Norton Air Force Base TCE plume has caused in the past or would cause in the future increased response costs for the Redlands TCE plume. (*Id.* at 655-56; Sterrett Decl. ¶¶ 20-21, 209-10.)

dissolved in the rain and percolated into the soil and eventually the groundwater. (*Cf.* Trial Tr. at 730 (Feenstra); Sterrett Decl. ¶ 141; PX1224 at 10.)

However, the Court also finds that some of the perchlorate contamination at the Burn Pit Area probably originated *pre*-burn. LPC operated the Burn Pit Area at Potrero Canyon much differently than its burn pits at the Redlands facility. Rather than burning propellant wastes on a daily basis, mere minutes after putting the wastes into the pit (*see* USX910 at 183-84 (Heeseman Dep.); USX963 at 86 (Speer Dep.)), at the Potrero Canyon facility LPC accumulated wastes (propellant, solvent, etc.) over months and burned them only a few times per year. (*See* USX49.0074-75; USX53.)[49] The pits were deeper than those at Redlands and the burns much larger – each containing up to 250,000 pounds of wastes. (USX49.0074-76.)

Larry Borgelt, a safety engineer at LPC from 1966 to 1974, explicitly contrasted the Redlands and Potrero Canyon burn pits (USX842 at 432-33 (Borgelt Dep.)), referring to the latter as a "disposal area." (USX841 at 318 (Borgelt Dep.).) In anticipation of a burn event, LPC stored some wastes in drums on a concrete pad (USX49.0077), but also accumulated wastes directly in the burn pits. (*See* Sterrett Decl. ¶ 228.) Some of the barrels accumulated in the pits were leaking and some were emptied directly onto the ground. (USX841 at 318-19 (Borgelt Dep.); USX842 at 432 (Borgelt Dep.).) These pre-burn event practices contributed to the perchlorate contamination associated with the Burn Pit Area. Liquid wastes containing AP, either poured directly into the burn pit or leaking out of barrels, percolated into the soil and groundwater. Likewise, solid AP dumped into the burn pit weeks or months before a burn would dissolve in the rain and infiltrate into the soil and groundwater. (Sterrett Decl. ¶ 230.)

[49] This was only the case following the termination of the Large Solid Propellant Motor Program in 1966. Prior to 1966, LPC burned materials on a daily or weekly basis. (Feenstra Decl. ¶ 156; USX49.0076.)

LPC's "hog out" procedures caused the perchlorate soil and groundwater contamination associated with the Large Motor Washout Area and the Rocket Motor Production Area. (Sterrett Decl. ¶¶ 220-21.) As described above, LPC washed propellant out of defective rocket motors using high-pressure water jets to allow the reuse of the expensive metal rocket casings. (Feenstra Decl. ¶ 164; USX49.0068; USX12.0050, .0055-56.) The propellant was hogged out onto the bare ground where the AP leached out of the propellant, dissolved in the water, and percolated into the soil and groundwater. (Sterrett ¶ 221; USX49.0068; *cf.* PX1067 at 4.) Today, hog out procedures are a recognized source of perchlorate groundwater and soil contamination. (*See* PX1224 at 10.) As Mr. Bauer testified, "if they hogged out on the ground, then it's a source." (Trial Tr. at 1160 (Bauer).)

C. LaBorde Canyon facility

As with the Potrero Canyon facility, the parties do not dispute the sources of perchlorate contamination at the LaBorde Canyon facility. (*See* Trial Tr. at 1238-39 (Lockheed and government counsel).) Perchlorate contamination associated with the Test Bay Canyons originated, as the name suggests, from rocket motor testing and firing operations. (Feenstra Decl. ¶ 169; Sterrett Decl. ¶ 240.) Although it is unclear precisely by what mechanism AP from the test-fired rocket motors ended up on the ground, the levels of perchlorate contamination associated with the Test Bay Canyon indicate that the ground surface was "flood[ed]" with "perchlorate-bearing water." (Feenstra Decl. ¶ 169; *see also* Sterrett Decl. ¶ 240.) Dr. Feenstra hypothesized that LPC may have "hogged-out" defective motors at the Test Bay Canyon. (Feenstra Decl. ¶ 169.)

Perchlorate contamination associated with the Waste Discharge Area was caused, at least in part, by LPC's disposal of propellant wastes from its burn pits. (Feenstra Decl. ¶ 170; Sterrett

Decl. ¶ 241.) In 1962, the Santa Ana Regional Water Pollution Control Board issued a Resolution to LPC to direct its operation of the Waste Discharge Area. (*See* PX1116.) Under that Resolution, LPC was allowed to dispose of approximately 5000 gallons per year of propellant waste that remained after burning in a burn pit. (PX1116 at 1-2.) As described above, burning did not completely destroy all of the AP in propellant wastes. Thus, some of the AP residue remaining in the wastes disposed of at the Waste Discharge Area dissolved in rainwater and percolated into the soil and groundwater. (*See* Trial Tr. at 730 (Feenstra); Feenstra Decl. ¶ 171; PX1224 at 10.)

II. TRADITIONAL EQUITABLE ALLOCATION

Because the parties have stipulated to liability, and substantially all of LPC's operations at the Sites were in performance of government contracts or subcontracts, the Court begins its analysis by invoking the *per capita* approach: a fifty-fifty split between Lockheed and the government. *Cf. Davis*, 31 F. Supp. 2d at 63-64 (describing the proper and improper times to begin with a *per capita* approach). (*See also* Trial Tr. at 29-30 (Lockheed counsel advocating a *per capita* approach); *id.* at 1931, 1941 (Lockheed closing).) From there, the Court adjusts the equitable allocation based on its findings, keeping in mind that "[m]athematical precision in this process is not realistically achievable or desirable." *United States v. Consolidation Coal Co.*, 184 F. Supp. 2d 723, 744 (S.D. Ohio 2002).

A. Limited value of certain equitable factors

1. Waste attributable to each party

In many cases, "the dominant factor in determining each party's equitable share of liability is the extent to which the response costs are attributable to waste for which that party is directly responsible." *Davis*, 31 F. Supp. 2d at 64. This consideration, reflected in the first three

Gore Factors and the first Torres factor, is inapplicable here, for all of the perchlorate and TCE contamination originated from LPC's operation of the Sites in the performance of its government contracts. It is therefore impossible to attribute even rough quantities of the perchlorate and TCE contamination between the parties without delving into issues regarding the extent of the government's involvement in and control over waste disposal practices at the Sites. (*See infra* Section II.B.-C.)

2. Parties' relative benefits from waste disposal activities

"Fairness suggests that parties deriving greater benefit from disposal of hazardous waste should bear a greater portion of the responsibility for mitigating its adverse effects." *Davis*, 31 F. Supp. 2d at 66; *see also Weyerhaeuser*, 771 F. Supp. at 1426. The economic benefits to the parties from LPC's operations at the Sites were "roughly equal." *See AISLIC II*, 2013 WL 135405, at *9. The government benefitted from LPC's research and development and received rockets supporting eight major Cold War-era programs, and LPC received payments for these services and products. *See id.* Although LPC may not have reaped large profits from its contracts with the government, it helped its parent corporation Lockheed Aircraft Corporation establish a foothold in the rocket propulsion field, a position that Lockheed retains to this day.[50]

3. Degree of cooperation.

The sixth and final Gore factor considers "the degree of cooperation by the parties with Federal, State or local officials to prevent any harm to the public health or the environment." *Envtl. Transp. Sys.*, 969 F.2d at 508. Because non-cooperating parties can undermine CERCLA's goal of promoting quick and efficient cleanups, *see Consolidation Coal*, 184 F. Supp. 2d at 751, "[t]he degree of cooperation with government officials to prevent any harm to

[50] *See* Lockheed's Memo. on the Benefit Received by Lockheed Propulsion Company, Feb. 20, 2014 [Dkt. No. 124] at 3-6; U.S. Memo. on the Benefit Received by Lockheed Propulsion Company, Feb. 23, 2014 [Dkt. No. 134] at 1-2.

the public health or the environment is very important in the contribution analysis." *Cent. Maine Power, Co. v. F.J. O'Connor Co.*, 838 F. Supp. 641, 646 (D. Me. 1993). Lockheed argues that because it has cooperated with California cleanup authorities since before remediation efforts began, and the government did not admit liability until the eve of this trial, the "cooperation" factor should favor Lockheed and disfavor the government. (Trial Tr. at 1939 (Lockheed closing).)

However, Lockheed proceeds on a somewhat distorted view of the facts. Although Lockheed has cooperated with the state authorities regarding cleanup at the Sites, it cooperation can hardly be considered voluntarily. Lockheed denied liability for the Redlands TCE plume for years (PX1677 ¶¶ 12, 36; Trial Tr. at 332 (Blackman)) and initiated cleanup efforts *only* after ordered to do so by the Santa Ana Regional Water Quality Control Board. (Trial Tr. at 331-32 (Blackman).) For the government's part, there is no evidence that any California state agency ever asked the government to undertake response efforts, and neither Lockheed nor any other party sought reimbursement from the government under CERCLA until this suit was filed in 2008. And while the government has not *directly* paid for any response costs yet, *see Consolidation Coal*, 184 F. Supp. 2d at 751 (finding that a failure to pay for response costs or actions prior to CERCLA suit relevant to whether the PRP meaningfully cooperated), its protests against doing so are grounded primarily on the fact that it has already *indirectly* paid for the majority of Lockheed's response costs at the Sites. (*See* Meyer Decl. ¶ 29 fig. 5.).

In short, Lockheed was forced by cleanup and abatement orders to undertake its remediation efforts, and the government has (albeit indirectly) footed most of the bill.[51] On these

[51] The fact that Lockheed has indirectly recovered through government contracts over 72% of its past response costs for the Sites distinguishes this case from *AISLIC II*, in which that court concluded the plaintiff's cooperation with state regulatory authorities over a twenty-year period, without assistance from

facts, the Court cannot conclude that the government has been meaningfully uncooperative such that it should receive an upward adjustment in its equitable allocation for the Sites.

4. The government's ownership of waste

Pursuant to the government property clauses in its contracts with LPC, the government owned an unknown, but undoubtedly sizable, amount of the AP and TCE that was disposed of at the Sites. Under government contracting provisions, title will vest in the government for certain property – including chemicals and other raw materials – purchased and used by a government contractor. When title vests in the government generally depends on the type of contract and whether contractor charges the property as a direct or indirect cost.

Under LPC's cost-reimbursement contracts, such as the Apollo subcontract (PX104), title vested in the government for property charged as a direct cost as soon as the property was delivered to LPC, and title vested for property charged as indirect costs at the earliest of three events, including LPC's use of property in performance of the contract or the government's reimbursement of the cost to LPC. (Johnson Decl. ¶ 8.) For LPC's fixed-price contracts with progress payments, such as the SRAM production subcontracts, title vested in the government for property charged as both direct and indirect costs upon the issuance of a progress payment to LPC. However, title reverted back to LPC at the termination of the contract. (*Id.* ¶ 9; Nagle Decl. ¶¶ 98, 103-105.)[52]

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the federal government, necessitated a 5% increase in the government's equitable share. *See AISLIC II*, 2013 WL 135405, at *5-6.

[52] Government regulations did not require fixed-price contracts without a progress payment clause (*e.g.*, USX188) to include a government property clause. (Nagle Decl. ¶ 100-01.) Thus, LPC owned and retained ownership of all AP and TCE used in its performance of those contracts. (*See id.* ¶ 102.) Due to the limited record in this case (*see supra* n. 31), it is impossible to determine what percentage of LPC's contracts were fixed-price without a progress payment clause or what percentage of AP and TCE wastes those contracts represented. (*See* Trial Tr. at 151-52, 156-57 (Johnson).)

LPC most likely charged most, if not all, AP as a direct cost and TCE as an indirect cost to government contracts. (Johnson Decl. ¶ 20; Nagle Decl. ¶ 135.) Thus, title vested in the government for both materials during some point in the manufacturing processes and, depending on the contract type, remained vested in the government indefinitely (cost-reimbursement) or until the end of the contract (fixed-price with progress payments). In either event, the government retained title over at least some of the AP and TCE at the time of their disposal at the Sites.[53] Lockheed argues that the government's ownership of the AP and TCE ultimately disposed of at the Site should result in a higher equitable allocation for the government. (*E.g.*, Trial Tr. at 33 (Lockheed opening).)

Merely owning the hazardous substances that caused response costs is, however, insufficient for liability under CERCLA. *See Morton Int'l*, 343 F.3d at 679. Instead, a non-disposing owner of a hazardous substance is generally liable only if he arranges for its disposal or treatment by a third party. 42 U.S.C. § 9607(a)(3); *see also Burlington N.*, 556 U.S. at 610-11. The Court considers this distinction to be an important signal that, in passing CERCLA, Congress was more interested in holding liable, where distinguishable, those *who disposed of* and *controlled the disposal* of hazardous substances rather than those *who owned* them.

In its exercise of equitable discretion, the Court applies this distinction here. It is unclear how much of the AP or TCE used (and disposed of) at the Sites the government actually owned. While the government ownership was likely significant in absolute terms (*e.g.*, pounds of AP or

[53] Mr. Nagle, the government's contracting expert, opined that "any title to materials acquired by the government pursuant to a title vesting clause[] would not survive the consumption of the material in the manufacturing process and, therefore, the government did not 'retain' title to waste generated by [LPC] during contract performance." (Nagle Decl. ¶ 143.) The Court is sympathetic to Mr. Nagle's pragmatic opinion that the title vesting clauses were not meant to extend to waste and shares his reluctance to engage in a debate over the metaphysical question of who owns waste at the molecular level. (*See* Trial Tr. at 1058 (Nagle).) However, from a textual standpoint, the contract clauses do not provide automatic title reversion or automatic government abandonment for "waste" property. Thus, the Court concludes that the government's title in AP and TCE survives even after each becomes "waste."

gallons of TCE), Lockheed's government contracts expert could not conclude with a reasonable degree of certainty that the government owned more than fifty percent of either AP or TCE used at the Sites. (Trial Tr. at 157 (Johnson).) Moreover, regardless of the government's ownership, Lockheed possessed the waste at all times up to and including the time of disposal. And, for fixed price contracts with progress payments (like SRAM), the waste – even if already disposed of – reverted back to Lockheed upon the termination of the contracts. *See AISLIC II*, 2013 WL 135405, at *8.

Thus, while ownership of the TCE and AP may be an important factor in establishing arranger liability under CERCLA § 107(a)(3), this is not the issue before the Court. Rather, as to the allocation analysis, the Court finds the ownership of the substances to be of limited value. *Cf. AISLIC II*, 2013 WL 135405, at *8. The critical issue is not ownership in the first instance, but rather the parties' respective control over the disposal of TCE and AP at the Sites. (*See infra* Section II.B.-C.)

5. The government's ownership of facilities

Owning a facility at the time hazardous substances were disposed of at that facility results in liability under CERCLA. *See* 42 U.S.C. § 9607(a)(2). From this statutory hook, courts frequently allocate an "owner's share" of liability to parties "simply by virtue of being the landowner," *United States v. R.W. Meyer, Inc.*, 932 F.2d 568, 571 (6th Cir. 1991), or owning the leaking or faulty equipment at a site. *E.g.*, *AISLIC II*, 2013 WL 135405, at *4-5.

Both parties owned equipment at the Sites. (*See, e.g.*, USX26.0018-28; USX27; USX28.0025-27.) Indeed, the government stipulated to its liability under CERCLA because it owned and furnished some of the major pieces of equipment for LPC's operations. (*See* Trial Tr. at 899 (government counsel).) Lockheed argues that government ownership of this equipment –

including the vapor degreaser in Building 91 and the hogged-out rocket casings at the Potrero and LaBorde Canyon facilities – should weigh in Lockheed's equitable favor because those pieces of equipment were sources of TCE and perchlorate contamination (*i.e.*, "facilities") at the Sites. (*E.g.*, Trial Tr. at 33 (Lockheed opening); *id.* at 1946 (Lockheed closing.)

Lockheed is correct that both the government-owned vapor degreaser and hogged-out rocket casings are "facilities" under CERCLA § 101(9). *See Am. Int'l Specialty Lines Ins. Co. v. United States* (*AISLIC I*), 2010 WL 2635768, at *23-24 (C.D. Cal. June 30, 2010). The Court, however, does not consider the government's mere ownership of certain pieces of equipment to have much importance in determining an equitable allocation. Instead, just as with the ownership of the waste, the Court considers "[f]actors additional to the simple fact of ownership" of facilities – in particular the parties' respective *control* over the disposal operations – to be the paramount equitable consideration. *See Yankee Gas*, 852 F. Supp. 2d at 248. Thus, the Court does not adjust the *per capita* equitable allocation on account of either party's ownership of equipment or facilities at the Sites.

6. Knowledge of risk of pollution from AP and TCE

The fifth Gore Factor considers "the degree of care exercised by the parties with respect to the hazardous waste concerned." *Envtl. Transp. Sys.*, 969 F.2d at 508. As the Court concluded above, the contamination at the Sites originated, *inter alia*, from pouring TCE and AP wastewaters, and burning solid propellant wastes, on the bare ground. Mr. Bauer, a government expert, opined these disposal practices violated the standard of care in existence at the time of LPC's operations. (Trial Tr. at 1086-87 (Bauer); Bauer Decl. ¶¶ 11(b), 11(e), 138(b).) The Court does not credit Mr. Bauer's testimony for two reasons.

First, although LPC knew that the Sites were located in areas with sensitive groundwater supplies (*see, e.g.*,USX15.0002-03; USX43.0002; USX50.0002; USX970 at 140-41 (Speer Dep.); USX977 at 35-36, 43 (Stickney Dep.)), neither TCE nor perchlorate were known groundwater contaminants at the time LPC operated the Sites. "[T]here was generally no recognition that TCE posed a danger to the environment until the mid 1970's." *Bolinder Real Estate, L.L.C. v. United States*, 2002 WL 732155, at *8 (D. Utah Apr. 24, 2002). Indeed, TCE groundwater contamination was first discovered in California only in 1979 (PX1537 at 12), and the EPA did not regulate TCE as a drinking water contaminant until 1989. (PX2060 at 18.) Similarly, according to the U.S. Government Accountability Office, perchlorate "was initially identified by EPA as a potential [groundwater] contaminant in 1995" (PX1229 at 3), and, according to the DOD, did not "emerge[] as an environmental issue of national interest [until] 1997," when new testing processes decreased the detection threshold from 400 to 4 µg/L. (PX1223 at 5; *see also* PX1229 at 3-4.)[54] Although LPC knew when it operated the Sites that AP was a dangerous material, their safety concerns were limited to fires and explosions and did not extend to environmental contamination. (*See, e.g.*, Trial Tr. at 87, 94-95 (Oppliger).)

Second, both pouring TCE and AP wastewaters and burning solid propellant wastes on bare ground were entirely consistent with the general standards of care in existence at that time. For TCE, the Court need look no further than the government's position in a prior case:

[54] Accordingly, the Court does not credit Mr. Bauer's testimony that members of scientific community knew that pouring TCE or AP wastewaters or burning propellants on the bare ground would cause groundwater contamination. (Trial Tr. at 1081-87 (Bauer).) Mr. Bauer's reliance on "personal experience and knowledge and chemical research" (*id.* at 1083), as well as a single, ambiguous scholarly article from 1953 that concluded "[s]olvents and soluble chemicals contained in industrial wastes . . . remain in solution in the liquid phase . . . and percolate downward to the underlying groundwater" (USX810.0006) is countered by the vast weight of the evidence that neither TCE nor perchlorate were considered groundwater pollutants at the time LPC operated the Sites. (*See* Feenstra Decl. ¶¶ 96-102 (TCE), 175-91 (AP/perchlorate); PX2020-2024 (summary tables of historic published literature on groundwater contamination re: TCE); PX2025-2028 (summary tables of historic published literature on groundwater contamination re: AP/perchlorate).)

> It is undisputed that the plaintiff's allegations of negligence, in particular, 'pouring the solvents onto the ground . . . ,' even if true, could not have violated any standard of care in existence prior to, or during . . . the early 1970s.

Snyder et al. v. United States, 04-cv-627, Gov't Memo. in Support of Mot. for Summ. J. at 3-4, (Feb. 22, 2006 S.D. Miss.) (PX2060). In *Snyder*, the government adopted its expert's opinion that the disposal of TCE on the bare ground and "'letting it evaporate' was common practice throughout the period from 1940 until 1973, followed manufacturer's recommendations, and was not at variance with state or federal regulations." (*Id.* at 19; *see also* PX1948 (summary table of historic manufacturer disposal recommendations for TCE).) This was so because the prevailing understanding at the time was that TCE poured on bare ground would evaporate or be absorbed in the surface or subsurface soils and "would not contaminate or alter the intended use of underground water supplies." (PX2060 at 19.)

For perchlorate, the Court does not credit Mr. Bauer's opinion that LPC should have burned AP and propellant wastes at the Redlands and Potrero Canyon facilities in burn pans rather than on the bare ground in burn pits. (Bauer Decl. ¶¶ 11(e), 133-36, 138(c).) LPC's burning of propellant wastes on the bare ground was consistent with both military and industry practice during LPC's operations at the Sites. Military manuals applicable to the LPC's operations explicitly recommended the burning of explosive wastes on bare ground. (*See, e.g.*, PX0002 at 316; PX0003 § 125(b)(1), (c); PX0005 §§ 3-6, 4-11, 4-12; PX0007 § 1505; PX0009 § 7-2(c).) And the United States military itself burned propellant wastes on the bare ground and in burn pits at its facilities (Trial Tr. at 1380 (Dull)), including at Camp Irwin, where the government occasionally disposed of wastes from the Redlands facility. (*See* USX852 at 168 (Borgelt Dep.).) Indeed, the government failed to identify *any* government facilities where burn pans were used for propellant wastes prior to the 1980s. It is no surprise, then, that the rampant

perchlorate groundwater contamination at historic DOD and NASA facilities was caused by the same activities for which the government now seeks to fault LPC: "disposing of perchlorate wastes in open pits, open burning and detonation of perchlorate, and using water to remove perchlorate residue from rocket engines." (*See* PX1229 at 26.)[55] Indeed, in 2010, the GAO identified, in California alone, seven government facilities with perchlorate-contaminated groundwater that were listed on the Superfund National Priorities List and eleven DOD facilities with perchlorate groundwater levels exceeding 15 µg/L. (*Id.* at 42, 44.)

On these facts, the Court cannot agree with the government's position that LPC breached any generally recognized standard of care by pouring TCE and AP wastewaters and burning solid propellant wastes on the bare ground at the Sites.[56]

7. Violation of California water quality laws

A party's violation of an environmental law in force at the time of its disposal of hazardous wastes can be an important equitable factor relevant to a PRP's degree of care,

[55] The Court also concludes that LPC's hog out procedures did not violate any a standard of care in existence at the time. In the 1970s, "hogging out" was widely used by solid propellant rocket motor manufacturers as a cost-saving tactic that allowed the reuse of expensive metal rocket casings. (*See* PX0457 at 5-10 to 5-11; *see also* PX1229 at 26.) Indeed, as late as 1975 DOD contracted with companies to hog out rocket motors. *See AISLIC I*, 2010 WL 2635768, at *11-12.

[56] Mr. Bauer appeared to adopt the so-called "precautionary principle" as the relevant standard of care in a CERCLA allocation action. (*See, e.g.*, Trial Tr. at 1087, 1141 (Bauer).) An amorphous pillar of contemporary environmental theory, the precautionary principle "requires that in the light of scientific uncertainty, when credible evidence is put forth that a risk exists, action should be taken to minimize that risk or eliminate it even though absolute proof has not been obtained which quantifies the risk." *New Mexico v. Gen. Elec. Co.*, 335 F. Supp. 2d 1185, 1221 (D.N.M. 2004); *see also* OXFORD DICTIONARY OF ENVIRONMENT AND CONSERVATION 353 (2008); Thomas O. McGarity, *MTBE: A Precautionary Tale*, 28 HARV. ENVTL. L. REV. 281, 334-35 (2004). While the precautionary principle may be equitably applicable in other CERCLA cases, it is of little value here. For applying the precautionary principle as a standard of care requires, at a minimum, a demonstration that some factual basis for the exercise of precaution – *i.e.*, knowledge of the potential environmental risk – existed at the time of the relevant disposals. There is no such factual basis here, for scant evidence exists that anyone (the government included) was exercising precaution, or had any inkling to do so, with regard to the disposal of TCE or AP between 1954 and 1975. Hindsight, however perfect, is an insufficient basis for imposing a standard of care as demanding as the precautionary principle.

culpability, and cooperation with government authorities. Environmental violations are most relevant to the extent that (1) the law is not coterminous with CERCLA liability (*i.e.*, strict liability for disposal of hazardous substances); (2) the party's actions clearly violated the law as established at the time of the disposals; (3) those violations were either knowing or reckless; and (4) compliance with the law would have reduced the total contamination or response costs.

The government argues that LPC's equitable share should be increased because it failed to submit reports of various waste discharges at the Sites as required under the Dickey Act, 1949 Cal. Stat. ch. 1549. (Trial Tr. at 874, 901-02 (gov't opening).)[57] Passed in 1949, California's Dickey Act established regional water quality control boards and a state water quality control board "to co-ordinate state activities with regard to water pollution and nuisance by sewage and industrial waste." *See* Note, *California's Water Pollution Problem*, 3 STAN. L. REV. 649, 652 (1951). Dickey Act § 13054 required "[a]ny person proposing to discharge sewage or industrial waste within any region, other than into a community sewer system, [to] file with the regional board of that region a report of such proposed discharge." (USX122.0007.)[58] Once a discharger filed a report, the regional board was to "prescribe requirements as to the nature of such discharge with relation to the conditions existing from time to time in the disposal area or receiving waters upon or into which the discharge is proposed and notify the person proposing the discharge of its action." (*Id.*) The discharger was required to "provide adequate facilities to meet any such requirements" prescribed by the regional board. (*Id.*)

[57] The government did not dispute Lockheed's assertion that LPC complied with California's air pollution laws by obtaining the necessary permits when operating the evaporation and burn pits at the Sites. (Trial Tr. at 1751 (Lockheed closing); Feenstra Decl. ¶¶ 40, 49-50.)

[58] Dickey Act § 13005 defined "industrial waste" broadly as "any and all liquid or solid waste substance, not sewage, from any producing, manufacturing or processing operation of whatever nature." (USX122.0002.)

According to the California Attorney General's interpretation of the Dickey Act, the disposal of industrial waste "on land with a possible subsequent movement by evaporation or percolation into . . . underground waters" was considered an "indirect" discharge. 48 Op. Cal. Att'y Gen. 85, 86 (1966) (USX1175). The government asserts that LPC repeatedly violated the Dickey Act by disposing liquid industrial wastes – *e.g.*, TCE and AP wastewaters – on the bare ground at various locations at the Sites without filing notices of proposed indirect discharges with the Santa Ana Regional Water Quality Control Board. (*E.g.*, Trial Tr. at 900-03 (gov't opening); Bauer Decl. at ¶ 168.)[59] Mr. Bauer opined that LPC was aware of the Dickey Act because it submitted a notice of proposed waste discharge in 1962 for the Waste Discharge Area at the LaBorde Canyon facility and subsequently received a Resolution from the Board approving the proposed discharge. (Bauer Decl. ¶ 168.)[60] Mr. Bauer further opined that had LPC submitted notices of proposed waste discharges for its various indirect discharges across the Sites, the Board would have investigated and likely placed requirements on the discharges to limit groundwater pollution. (*Id.* ¶ 166.)

Lockheed's expert, Mr. Delaney, testified in response that LPC had no responsibility under the Dickey Act to file notices of proposed waste discharges with the Board for the

[59] In particular, Mr. Bauer opined that LPC violated the Dickey Act by failing to notify the Board of most of its disposal activities, including, but not limited to, LPC's use of burn pits at the Redlands and Potrero Canyon facilities, the washout from grinding and mixing buildings and the discharges from Building 77's south sump at the Redlands facility, the hog out procedures at the Potrero Canyon and LaBorde Canyon facilities, and the waste disposal areas at the Potrero Canyon and LaBorde Canyon facilities. (*See, e.g.*, Bauer Decl. ¶¶ 104, 117, 122, 137, 168.)

[60] Mr. Bauer also opined that LPC violated its Dickey Act Resolution for the Waste Discharge Area at the LaBorde Canyon facility – Resolution 62-24 – by constructing too many ponds and by discharging perchlorate and other compounds not listed in the resolution. (Bauer Decl. ¶¶ 205-06.) However, under that Resolution, the Board was allowed to and did "[p]eriodically" inspect the Waste Discharge Area to ensure compliance with the Resolution. (PX1116 at 3; PX1121; PX 1130.) Further, as noted above, no one at the time knew that the burn pit residues disposed of at the Waste Discharge Area would still contain perchlorates. **(***See* Trial Tr. at 730 (Feenstra); Feenstra Decl. ¶ 171; PX1224 at 10.) Based on these facts, the Court cannot agree that LPC violated Resolution 62-24 when operating the Waste Discharge Area at the LaBorde Canyon facility.

disposals of TCE and propellants on the bare ground at the Sites. (Delaney Decl. ¶ 13.) In particular, Mr. Delaney opined that neither the Dickey Act nor its successor, the Porter Cologne Water Quality Act of 1969, 1969 Cal. Stat. ch. 482, prohibited "intermittent or accidental wastewater [indirect] discharges" such as those that occurred at the Sites. (Delaney Decl. ¶ 13; *see also* Trial Tr. at 419-20 (Delaney).) Instead, according to Mr. Delaney, the notification provisions of the Dickey Act only covered "large-scale, purposeful" disposals of industrial wastes directly or indirectly into surface or groundwaters. (Trial Tr. at 419 (Delaney); Delaney Decl. ¶ 13.)

Although the parties dedicated a significant amount of time to the issue of whether LPC violated the Dickey Act, the Court is unable to resolve this debate for purposes of determining Lockheed's equitable share. First, it is unclear whether LPC had the duty to report to the Board its disposal of TCE and propellant wastes on the bare ground at the Sites. Contrary to Mr. Delaney's opinion, the Dickey Act *does not* provide an exception for *de minimis* or intermittent discharges. Instead, the plain language of the statute required a notice of proposed waste discharge for *any* discharge of industrial waste. (USX122.0007.) Further, that TCE and AP were not known groundwater pollutants at the time (*supra* Section II.A.6) seems irrelevant under the Dickey Act's broad definition of "industrial waste." (USX122.0002.) On the other hand, the Board periodically inspected each of the Sites (*see* PX1121; PX1130), and no evidence exists that the Board ever instructed LPC to file a notice of proposed waste discharge for any of its disposal activities. (*Cf.* PX1130 ("No written instructions or regulations from [the Board] has been received.").) Indeed, in 1967, the Board considered "the amount of industrial waste discharged by LPC into the water drainage basin . . . to be negligible." (*Id.*) This arguable conflict between the statute and the Board's on-the-ground enforcement of the Dickey Act

suggests that the Board and LPC's contemporaneous understanding of the Act was that it *did not* apply to LPC's disposal activities.[61]

Second, even assuming *arguendo* that the Dickey Act applied to LPC's disposal activities, the Court cannot agree with Mr. Bauer's speculation had LPC complied with the law, the Board would have imposed requirements that would have reduced groundwater contamination or response costs at the Sites. Under the Dickey Act, the Board lacked the power to *prohibit* indirect discharges. 48 Op. Cal. Att'y Gen. at 86.[62] Further, although the Board could set limits on the concentrations of contaminants in discharged industrial waste (*see* Trial Tr. at 1129-31), the statute "prohibited [the Board] from specifying the design, location, type of construction or particular manner in which compliance may be had." Ronald R. Robie, *Water Pollution: An Affirmative Response by the California Legislature*, 1 PAC. L. J. 2, 19-20 (1970). Considering the Board's seeming lack of concern regarding LPC's industrial waste disposal practices (*see* PX1130), the fact that neither TCE nor perchlorate were recognized groundwater contaminants at the time,[63] and that LPC generally operated consistent with the recognized standards of care for TCE and AP waste disposal (*see supra* Section II.A.6), the Court is unable to conclude that if LPC had reported its waste discharges, the Board would have required LPC to

[61] The government provided no evidence that other solid rocket motor manufacturers filed notices of proposed waste discharges for the common disposal methods, *i.e.*, burn pits and hogging out, that are at issue here. Indeed, with the exception of the Aerojet General Corporation's notice of proposed waste discharge (which, as discussed *infra* n. 64, is not comparable to Lockheed's activities at the Sites), the government provided no evidence that any manufacturers at the time filed notices of proposed waste discharges related to TCE or perchlorate.

[62] Although the Porter-Cologne Water Quality Control Act was passed in 1969, it was not until 1975 that the California Attorney General interpreted the statute as providing regional boards with the authority to prohibit indirect discharges. 58 Op. Cal. Att'y Gen. 531, 531 (1975) (USX1176).

[63] Indeed, as the Los Angeles Regional Water Quality Control Board stated *in 1980*, "TCE and other volatile organics now listed on EPA priority pollutant lists were not known or believed to have been posing [a] pollution threat to groundwaters because of their high volatility and loss to evaporation at the time of use" in the 1950s through the 1970s. (PX1532 at 128.)

undertake preventative actions to reduce the TCE or perchlorate concentrations in its industrial wastes before disposal.[64] The government's suggestions that the Board could have set discharge limits that required burn pans or other preventative measures (Trial Tr. at 881, 903-04 (gov't opening); *id.* at 1140 (Bauer); Bauer Decl. ¶ 35) are also speculative and lack support in the record.

In sum, the Court cannot conclude that LPC violated the Dickey Act as it was understood or applied at that time or that LPC's "compliance" with the Act would have led to Board regulation of its discharges and thus reduced contamination and response costs at the Sites today. Accordingly, the Court gives no equitable weight to the issue of LPC's compliance (or lack thereof) with the Dickey Act.

[64] To argue otherwise, the government points to the regulation, under the Dickey Act, of the Aerojet General Corporation's solid rocket motor production site in Rancho Cordova, California. (*See, e.g.*, Trial Tr. at 883-84, 900-01 (gov't opening); Bauer Decl. ¶ 34.) Aerojet submitted a notice of proposed waste discharge to the Central Valley Regional Water Pollution Control Board in the early 1950s and the Board adopted a Resolution prohibiting the discharge of wastes containing, *inter alia*, TCE and AP "in a manner which will permit their entry into either the groundwater or the waters of the American River." (USX128.0002.) The Board modified the Resolution in 1962 to impose stricter discharge limits. (USX132.) The government argues that Aerojet's filing of a notice of proposed waste discharge and the Board's issuance of Resolutions regarding those discharges demonstrates both that LPC violated the Dickey Act and that, had LPC filed a notice of proposed waste discharge, its regional board would have regulated its disposals as indirect discharges.

However, Aerojet's operations are too distinct from LPC's to credit the government's argument. First, Aerojet's discharge methods were *specifically designed* to allow its industrial wastes to percolate into the ground. (*See* Trial Tr. at 413-14 (Delaney); *id.* 802-03 (Feenstra).) LPC's only directly comparable disposal processes at the Sites were the "percolation pits" in the Waste Discharge Area at the LaBorde Canyon facility, for which LPC *did* file a notice of proposed waste discharge. (*See id.* at 802-03 (Feenstra).) Second, Aerojet's disposals were voluminous – up to 1000 gallons per day – and contained a much higher quantity of AP than at LPC's Sites – up to 270 pounds per day. (PX1112 at 1; Trial Tr. at 1154 (Bauer).) Even so, the Board's concern with Aerojet's discharges was toxicity to plant life. (PX1112 at 3.) And finally, the Aerojet and LPC operations fell under the jurisdiction of different regional water quality control boards – Central Valley and Santa Ana, respectfully – such that the Court cannot automatically infer that the Santa Ana Board would have taken the same actions for LPC that the Central Valley Board took at the Aerojet facility. Accordingly, the Court finds that Aerojet's regulation under the Dickey Act is of limited relevance to this case.

8. Ability to Pay

"[T]he principal reason for considering ability to pay is to ensure that the party seeking contribution will not bear sole responsibility for any portion of the joint liability otherwise attributable to defendants from whom recovery is unlikely." *Davis*, 31 F. Supp. 2d at 66. This factor is not an open invitation for courts to increase or decrease a party's equitable share based solely on net worth, but is instead meant to recognize "that a PRP's share of liability should not be established at a level that exceeds its resources," lest the plaintiff be left to shoulder that PRP's equitable share. *Id.*[65] In this case, the parties' abilities to pay have no real importance because both Lockheed and the federal government are capable of shouldering the entirety of the cleanup costs for the Sites. The Court notes, however, that in the recent years of increased government austerity and serious fiscal shortfalls, Lockheed has – primarily through U.S.-government contracts – seen "record . . . earnings, and profit margin as well as strong cash generation." (*See* Press Release, *supra* n.22.)[66]

9. Indemnification provisions

Both parties claim that certain indemnification clauses in the contracts argue in favor of lowering their share. Indemnification merely shifts, but does not negate, CERCLA liability. *See* 42 U.S.C. § 9607(e)(1). To determine whether pre-CERCLA indemnification clauses cover

[65] In this regard, the "ability to pay" consideration is an *ex ante* protection against so-called "orphaned" shares – "those shares of 'liability attributable to a party who is insolvent, cannot be located, or cannot be identified.'" *PCS Nitrogen*, 714 F.3d at 168 (quoting *Lyondell Chem. Co. v. Occidental Chem. Corp.*, 608 F.3d 284, 303 (5th Cir. 2010)).

[66] Since 1994, Lockheed's stock price has soared from around $20 per share to around $160 per share today, more than doubling the performance of the S&P 500 and the Dow Jones Industrial Average during that time period. *See Lockheed Martin Corporation*, YAHOO! FINANCE, http://finance.yahoo.com/echarts?s=LMT+Interactive#symbol=LMT;range= (last visited April 22, 2014) (compare with "DJI" and "GSPC" from January 3, 1994 to April 1, 2014). Although Lockheed's net sales were down in the first quarter of 2014, its profits were up by over 22% ($172 million) compared to the first quarter of 2013. Press Release, Lockheed Martin Corp., Lockheed Martin Reports First Quarter 2014 Earnings Results (April 22, 2014), *available at* http://www.lockheedmartin.com/us/news/press-releases/2014/april/0422hq-earnings.html.

CERCLA liabilities, "courts have uniformly held that the clause must be either '[1] specific enough to include CERCLA liability or [2] general enough to include any and all environmental liability which would, naturally, include subsequent CERCLA claims.'" *Elf Atochem N. Am. v. United States*, 866 F. Supp. 868, 870 (E.D. Pa. 1994) (quoting *Beazer E., Inc. v. Mead Corp.*, 34 F.3d 206, 211 (3d Cir. 1994)). Neither the indemnification provisions in the government-owned facilities contracts (which favor the government) nor the ultra-hazardous activities indemnification provisions in the SRAM production subcontracts (which favor Lockheed) satisfy this test.[67]

The government asserts that indemnification provisions in its facilities contracts support imposing a higher equitable allocation on Lockheed. During LPC's operations at the Sites, the government and Lockheed entered into facilities contracts that provided (often rent-free) government-furnished equipment – *e.g.*, the vapor degreaser in Building 91 – to LPC for its use in performance of its contracts. (USX228.0004 (28 C.F.R. §13.101-8 (1955).) Facilities contracts were required to have government indemnification clauses. (Trial Tr. at 952-53 (Nagle); Nagle Decl. ¶ 109.) Under one example of a government indemnification provision, LPC agreed to

> indemnify and hold the Government harmless against claims for injury to persons or damage to property of the contractor or others arising from the Contractor's possession or use of the Facilities. However, the provisions of the Contractor's related procurement contracts shall govern the Government's assumption of liability for such claims arising out of or related to the performance of each such related procurement contract and involving the possession or use of the Facilities.

(USX84.0029; USX 113.0020.)

[67] At least two abandonment contracts, through which the United States abandoned government-owned equipment or raw materials, contained indemnification provisions that clearly shifted liability arising from the disposal of those equipment and raw materials (including AP) to LPC. (*E.g.*, PX461; PX1073.) Because those contracts are so few, and limited to relatively small amounts of hazardous substances, they are insufficient to shift the equities in this case.

The language in this provision is typical "of the type of language used to indemnify a transferor against a tort, nuisance or trespass claim" – environmental liabilities are nowhere mentioned. *See Mobay Corp. v. Allied-Signal, Inc.*, 761 F. Supp. 345, 358 (D.N.J. 1991). Without more, the Court may not infer any intent to cover CERCLA response costs. *Id.* Moreover, the provision is expressly limited by any contrary liability-shifting provisions in the related procurement contract. (USX84.0029.) Thus, even assuming the facilities indemnification provision *did* cover CERCLA response costs, it is impossible to determine whether the provision applies to any given instance of disposal without reference to the procurement contract – the vast majority of which are not available. In any event, the Court's conclusion that the *ownership* of facilities has little probative value in determining allocation as compared to the *operation* of those facilities (*see supra* Section II.B.5) means that the facilities indemnification provisions are of little importance. Accordingly, the Court gives no weight to the government indemnification provisions in the facilities contracts.

For its part, Lockheed asserts that indemnification provisions in the 1971-75 SRAM production subcontracts – LPC's largest contracts at the Sites – support an equitable adjustment in its favor. (Trial Tr. at 1848-51 (Lockheed closing).) Through these indemnification provisions, the government agreed to "hold harmless and indemnify" LPC against, *inter alia*,

> [c]laims (including reasonable expenses of litigation or settlement) by third persons . . . for death, bodily injury (including sickness or disease), or loss of, damage to, or loss of use of property; [l]oss of or damage to property of [LPC], and loss of use of such property, but excluding loss of profit; . . . to the extent that such a claim, loss or damage arises out of the direct performance of this contract; is not compensated by insurance or otherwise; and *results from a risk defined in this contract to be unusually hazardous*.

(PX0560 § 5.4.2.1 (emphasis added).) The contracts defined as "unusually hazardous":

> all risks resulting from or in connection with (i) the explosion, detonation, combustion, or surface impact of a missile, simulated missile or component

> thereof utilizing the material delivered or services rendered under this contract; (ii) the use of materials containing radioactive, toxic, explosive or other hazardous properties of chemicals or energy sources . . . regardless of whether the harm occurs before or after delivery to the Government of equipment or materials under this contract, or within or outside the United States.

(*Id.* § 5.4.1.1.)

The broad definition of "unusually hazardous" risks arguably covers the use and disposal of AP and TCE, as "explosive" and "toxic" chemicals, respectfully. However, assuming *arguendo* that the SRAM indemnification provisions are broad enough to cover CERCLA response costs,[68] the Court finds that they are not useful in making an allocation determination for two reasons. First, Lockheed voluntarily dismissed *with prejudice* its contract action before the Armed Services Board of Contract Appeals, in which it sought from the United States indemnification under these precise provisions in its SRAM production subcontracts. (USX83.)[69]

[68] The Court questions whether the provision's relevant limitation to "damage to property" is too narrow to unambiguously cover CERCLA response costs. Because CERCLA is not a tort statute, it "does not provide compensation to a private party for damages resulting from contamination." *Gussack Realty Co. v. Xerox Corp.*, 224 F.3d 85, 91 (2d Cir. 2000). And, although a majority of courts hold that, in the insurance context, response costs incurred under CERCLA are considered "property damages," *see, e.g.*, *Indep. Petrochemical Corp. v. Aetna Cas. & Sur. Co.*, 944 F.2d 940, 945-46 (D.C. Cir. 1991) (applying Missouri law); *AIU Ins. Co. v. Superior Court*, 799 P.2d 1253, 1270-71 (Cal. 1990); Carol A. Crocca, Annotation, *Liability Insurance Coverage for Violations of Antipollution Laws*, 87 A.L.R. 444 (1991), "[v]iewed outside the insurance context, the term 'damages' is ambiguous: it is reasonably open to different constructions." *Cont'l Ins. Companies v. Ne. Pharm. & Chem. Co.*, 842 F.2d 977, 985 (8th Cir. 1988); *see also New Castle Cnty. v. Hartford Acc. & Indem. Co.*, 933 F.2d 1162, 1188 (3d Cir. 1991). The case law distinguishes between "ordinary" meaning of "damages," which would encompass traditionally equitable recoveries, and the "legal" meaning, which differentiates legal damages (like in a tort action) and equitable remedies (like a recovery under CERCLA). *See New Castle Cnty.*, 933 F.2d at 1187-88. Considering this ambiguity in the term "damages", it is at least questionable whether the plain language of the SRAM indemnification provisions encompassed environmental cleanup costs, or was instead simply a run-of-the-mill tort provision narrowly targeted to certain "unusually hazardous" risks. *Cf. Mobay Corp.*, 761 F. Supp. at 358.

[69] Even had Lockheed dismissed its claims before the ASBCA *without prejudice*, under the Tucker Act this Court would lack subject-matter jurisdiction over any *legal* claims for indemnification under the SRAM production subcontracts because those claims would be based entirely in contract and

Second, and more importantly, the predominant concern *in equity* is the intent of the parties, not whether the plain language of the indemnification provision would bind either party in law. *See Beazer E., Inc. v. Mead Corp.*, 412 F.3d 429, 447 (3d Cir. 2005) (taking into account intent of parties even though the court had previously concluded that, as a matter of law, the agreement did not provide indemnification for CERCLA response costs); *Halliburton*, 648 F. Supp. 2d at 880-81, 884 ("[T]he issue is not whether the indemnity provisions apply to this case or are enforceable, but what the parties intended as to allocation.") Beyond the arguably ambiguous text of the indemnification provisions, there is no evidence that the parties intended the government to indemnify LPC for environmental contamination caused by routine disposals of TCE and propellant wastes. The SRAM indemnification provisions were added to the SRAM subcontracts pursuant to Public Law 85-804. (Trial Tr. at 217-18 (Johnson).) According to Lockheed's contracting expert, Mr. Johnson, Public Law 85-804 was a "special statute" enacted "to handle catastrophic risks that insurance cannot possibly cover" (*id.* at 217) – namely a "missile going astray and causing civilian casualties." (*Id.* at 254.) Indeed, as described by the Senate Report accompanying the law:

> The need for indemnity clauses in most cases arises from the advent of nuclear power and the use of highly volatile fuels in the missile program. The magnitude of the risk involved under procurement contracts in these areas have rendered commercial insurance either unavailable or limited in coverage.

S. REP. NO. 2281, 85th Cong., 2d Sess., at 3, *reprinted in* 1958 U.S.C.C.A.N. 4043, 4045.[70] The pollution here, while tragic, is by no means "catastrophic" in the sense envisioned by drafters of

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seek relief greater than $10,000. 28 U.S.C. §§ 1346(a)(2), 1491(a)(1); *see also Franklin-Mason v. Mabus*, 742 F.3d 1051, 1054-55 (D.C. Cir. 2014).

[70] Further, Boeing first requested indemnification under Public Law 85-804 for its SRAM contracts in 1966 "on the basis that performance under the contract will involve unusually hazardous risks in the event of an incident of catastrophic proportion resulting from explosion, malfunction or ground/flight accident precipitating a nuclear incident." (PX506 at 1.)

Public Law 85-804 and could have been insured against at the time.[71] Accordingly, the Court gives no equitable weight to the indemnification provisions in LPC's SRAM production subcontracts.

B. LPC exercised significantly more control than the government over the day-to-day hazardous waste disposal operations at the Sites.

As noted, the paramount equitable factor in this case is the comparative level of control the parties exercised over disposal practices at the Sites, a variation on the fourth Gore factor's focus on "the degree of involvement by the parties in the generation . . . [and] disposal of the hazardous wastes." *Envtl. Transp. Sys.*, 969 F.2d at 508. The Court analyzes this equitable factor through the operator liability framework set forth in *Bestfoods* and its progeny.

Of course, because the parties have stipulated to liability, the Court is not required to determine whether either party was an operator at the Sites. However, the Supreme Court's definition of operator liability in *Bestfoods* is helpful in delineating the *types of control* over which CERCLA extends and thus which party should be *more* responsible as an equitable matter.

Bestfoods limited operator liability under CERCLA to those parties who "manage, direct, or conduct operations specifically related to pollution, that is, operations having to do with the leakage or disposal of hazardous waste, or decisions about compliance with environmental regulations." 524 U.S. at 66-67. LPC clearly meets the *Bestfoods* standard. LPC employees planned, managed, and performed the day-to-day operations that resulted in disposals of AP and TCE at the Sites.

[71] In addition, Lockheed's argument that the SRAM indemnification provisions were intended to cover routine environmental spills flies in the face of one of Lockheed's central theses of the cases – that no one knew that releases of TCE and propellant wastes onto the ground would cause environmental harms. Having accepted Lockheed's position (*see supra* Section II.A.6), the Court is not inclined to view TCE and perchlorate pollution as posing "unusually hazardous" risks.

Lockheed argues that the government is also an operator under *Bestfoods* because (1) LPC's contracts incorporated government safety manuals, which included disposal practices; (2) DCAS approved process specifications, which included disposal procedures; (3) DCAS inspectors observed production processes and occasionally undertook facility-wide safety inspections; and (4) the government provided technical advice to LPC. (Trial Tr. at 31-32 (Lockheed opening); *see also* Lockheed's Response to the U.S. Memo. on Operator Liability, Feb. 25, 2014 [Dkt. No. 136] at 2-4.)

Even considering the height of government presence and influence at the Sites during the SRAM production years, the Court disagrees. Although the government had a significant presence and role at the Sites, there is no evidence that the government used its influence to manage or control the day-to-day disposal of hazardous wastes there. *See City of Wichita*, 306 F. Supp. 2d at 1055.

First, "courts have consistently held that contract provisions, specifications, and even mandates similar to those expressed in the [manuals at issue] are insufficient to show 'direction' or 'control' over waste disposal for purposes of establishing operator liability." *Steadfast Ins. Co. v. United States*, 2009 WL 3785565, at *7 (C.D. Cal. Nov. 10, 2009) (collecting cases); *see also City of Moses Lake v. United States*, 458 F. Supp. 2d 1198, 1227 (E.D. Wash. 2006) (where Lockheed, as a defendant, successfully argued that "specifications that govern the operation of missile maintenance facilities are relevant only insofar as they show that Lockheed managed or directed not just any 'operations,' but operations having to do with the leakage and disposal of hazardous waste."). The many manuals and specifications at issue in this case are no exception. The manuals permitted – but did *not* mandate – *some* of the common disposal operations LPC used at the Sites, including the use of burn pits for propellant wastes. (*See, e.g.,* PX0007 §§

1504-07 (allowing disposal of propellant waste by burning on bare ground, dumping at sea, or destruction by detonation).[72] And even assuming *arguendo* that the manuals guided LPC's decision to, for instance, use burn pits, this does rise to the level of daily *control* over waste disposal operations at the Sites by the government. Indeed, Lockheed was free to seek waivers from even mandatory provisions of manuals and such waivers were commonly granted if they would have no effect on design or performance. (Trial Tr. at 941 (Nagle); *cf.* USX221.0002.)[73]

Likewise, the government is not an operator at the Sites simply because DCAS representatives approved process standards that included disposal processes, observed certain production processes, and conducted periodic safety inspections. DCAS' approval, without more, of process standards does not constitute the degree of "direct[ion]" necessary to establish operator liability. *Cf. United States v. Dart Indus., Inc.*, 847 F.2d 144, 145-46 (4th Cir.1988) (a state regulatory body was not an operator for merely approving and inspecting disposal practices at private site). No manufacturing process standard existed for the ultimate disposal of wastes, either at the burn pits at the Redlands or Potrero Canyon facilities or at the waste disposal area at the LaBorde Canyon facility. Thus, the record does not support Lockheed's argument that the United States "'made, approved or ratified all significant operating decisions' at the sites." (Lockheed Operator Br. at 5 (quoting *Cadillac Fairview*, 299 F.3d at 1022). Indeed, even the process standards that did exist, although generally detailed, were vague as to what specific

[72] However, the manuals did not direct or recommend the other disposal methods LPC used, including the pouring of TCE or release of AP-contaminated wastewaters on the bare ground at Redlands.

[73] Lockheed urges that the distinction between "recommendation" and "requirement" in this case is a false one, citing *Nu-W. Min. Inc. v. United States*, 768 F. Supp. 2d 1082, 1090-91 (D. Idaho 2011). (Lockheed Operator Liability Br. at 4-5.) *Nu-West* is distinguishable because in that case the government was "actively involved in the design and location of the waste dumps, and in ensuring that the waste dumps complied with the mining plans and environmental rules." 786 F. Supp. 2d at 1091. Here, there is no such evidence of specific, let alone pervasive, government direction as to the placement, design, or operation of the burn pits, evaporation pits, sumps, or other waste disposal facilities or processes.

disposal practices should be followed. (*See, e.g.*, USX32 § 1.3 (stating that the washing of grinder parts "will be performed at the faucet and sump outside the lower level of Bldg. 77" without specifying into which sump the water was to flow.) DCAS' approval of such vague process standards cannot signal any meaningful degree of government direction or control over LPC's waste disposal practices.

Further, DCAS' day-to-day role at the Sites was limited to ensuring LPC's compliance with contract specifications for quality assurance purposes. (Nagle Decl. ¶¶ 40-41.) DCAS was not contractually obligated to perform inspections at the Sites. The government had the right, but not the duty, to inspect. (*Id.* ¶¶ 42-46; *see also* USX242.0003.) At least until 1970, the record indicates that DCAS' quality assurance inspections were insufficient both in quantity and quality. (*See* PX577 at 117; *see also* USX221.0004.) In fact, the AFRPL criticized DCAS – along with Boeing and LPC – for inadequate quality assurance procedures. (*See* PX577 at 117.). Most importantly, there is no evidence that *any* of the DCAS quality assurance inspection points, even at the height of DCAS oversight during the later SRAM years, included disposal – rather than production – processes. (*See generally* USX264 (listing "mandatory production certification inspection characteristics," none of which concerned disposal of wastes).) See *Miami-Dade Cnty. v. United States*, 345 F. Supp. 2d 1319, 1343 (S.D. Fla. 2004) (government was not liable as an operator where Air Force inspectors had "no objective, duty, or responsibility other than to enforce the . . . contract provisions by ensuring the delivery of quality products.").

DCAS's sporadic (prior to 1970) and periodic (after 1970) safety inspections[74] present a closer issue, yet still do not support a finding that the government was an operator. Wastes and

[74] There is evidence of *one* site-wide safety inspection by DCAS or its predecessor prior to 1969. (*See, e.g.*, PX321; PX471-472; PX1046.) Under SRAM, safety surveys were more common, but by no

waste (particularly propellant) disposal implicated worker safety, rather than environmental contamination. (*See* Trial Tr. at 87 (Oppliger); *see also* PX0009 § 7-1.1.) As a result, some DCAS safety inspections briefly touched on issues of waste. (*See, e.g.*, PX471 at 1 (1960 – questioning the efficacy of a drain from Building 52 to Evaporation Pit 61); PX0372 at 2 (1970 – out of over fifty safety-related observations, noting broken grating over sump pump at Building 77); PX0484 at 3 (1972 – out of nineteen items of concern, noting improper handling and storage of propellant trimmings)). However, these safety inspections – to the limited extent they concerned wastes at all – did not make recommendations regarding the ultimate disposal of the waste; rather, they were limited to the safe handling, storage, or transportation of waste prior to the disposal processes that LPC chose to use. Moreover, LPC could – and on occasion did – reject DCAS's waste-related recommendations arising out of its safety inspections. (*See* PX484 at 3 (rejecting DCAS's recommendation to use metal containers, rather than hamburger cartons and water, when handling propellant trimmings); *see also* Trial Tr. at 1023-24 (Nagle).) Ultimately, the sporadic nature of DCAS's inspections, combined with their limited focus on waste disposal activities *per se*, fails to demonstrate the level of frequent control over hazardous waste disposal activities required for operator liability under *Bestfoods*

The same can be said for the government's technical involvement at the Sites. During the SRAM period, government representatives at the Sites from the SPO were primarily "observers" pursuant to the TSPR initiative. (*See, e.g.*, Trial Tr. at 1338-40 (Dull).) To the extent SPO or AFRPL representatives gave technical direction to Boeing or LPC, the guidance related solely to product development and performance, not issues such as safety or, more specifically, waste disposal. (*See, e.g.*, *id.* at 1353.) Inspections and guidance unrelated to waste disposal, no matter

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means frequent. (*See, e.g.*, PX474 (1969); PX372-373 (April 1970); PX476-477 (June 1970); PX398, 484-485 (November 1972).)

how pervasive, are not indicative of operator liability under CERCLA. *See, e.g.*, *Miami-Dade Cnty.*, 345 F. Supp. 2d at 1343; *State of Wash. v. United States*, 930 F. Supp. 474, 485 (W.D. Wash. 1996) (finding no operator liability when "[g]overnment inspectors and accountants had no responsibility for directing activities that led to the deposit of the wastes. The primary concern of the inspectors and accountants was efficiency and cost control.").[75]

[75] The evidence of actual "direction" regarding the disposal of any wastes is limited to a few instances where the government abandoned property and instructed LPC – with LPC's consent – to destroy it by burning in the Potrero Canyon burn pits. (*See* PX0461; PX1073 at 1 ("Dispose [AP] by pit burning at your Portereo [sic] plant.").) These "occasional" instances of "direction," involving a miniscule percentage of the total wastes burned at the Sites, are insufficient to demonstrate the level of "frequent" direction or control required for operator liability. *See City of Wichita*, 306 F. Supp. 2d at 1055.

These documents do, however, demonstrate the government's liability as an arranger under CERCLA § 107(a)(3) for the Potrero Canyon facility. Lockheed attempts to go a step further by arguing that the government is liable as an arranger for all of the Sites based on its ownership of some of the TCE and AP wastes and its benefits under contracts with LPC, pursuant to which the wastes were disposed. (Lockheed's Memo. on Arranger Liabilty, Feb. 12, 2014 [Dkt. No. 121] at 3-5.) *AISLIC I*'s contrary holding notwithstanding, *see* 2010 WL 2635768, at *30, the Court has serious doubts that arranger liability – with its focus on whether the party "planned for" the disposal – attaches to the government based solely on the existence of output contracts and government title over wastes due to idiosyncratic federal procurement regulations. *See Burlington N.*, 556 U.S. at 612. A party "may not be held liable as an arranger under CERCLA unless the plaintiff proves that the [party] entered into the relevant transaction with *the specific purpose* of disposing of a hazardous substance." *Team Enterprises, LLC v. W. Inv. Real Estate Trust*, 647 F.3d 901, 909 (9th Cir. 2011). "Disposal of hazardous wastes must be a purpose of the transaction, not merely a foreseeable byproduct of the transaction." *Pakootas v. Teck Cominco Metals, Ltd.*, 832 F. Supp. 2d 1268, 1274 (E.D. Wash. 2011) (holding that Washington state was not liable as an arranger for contamination that occurred as a foreseeable result of allowing mining companies to operate mines on state lands.) Thus, where, as here, disposals of hazardous wastes occur as a foreseeable but incidental result of a production process, arranger liability does not presumptively attach. *See Shell Oil*, 294 F.3d at 1059; *Pakootas*, 832 F. Supp. 2d at 1274. Instead, arranger liability attaches only if the government exercised direction and control over waste disposal activities related to its contracts with LPC. *See Shell Oil*, 294 F.3d at 1055-56 (considering government's control over waste disposal at the site); *Gen. Elec. Co. v. AAMCO Transmissions, Inc.*, 962 F.2d 281, 286 (2d Cir. 1992) (same); *Pakootas*, 832 F. Supp. 2d at 1275 (same); *AISLIC I*, 2010 WL 2635768, at *30 (same). For this reason, the Court's analysis regarding control and direction for the purposes of operator liability necessarily leads the Court to decline to adjust the government's allocation as an equitable matter for being an arranger at any facility other than Potrero Canyon.

The Court will, however, minimally adjust its equitable allocation for the government based on its status as an arranger at the Potrero Canyon facility. The indemnification provisions that favor the government for those arranged disposals (*see* PX0461 at 2; PX1073 at 1) and the fact that the arranged disposals were limited to relatively small amounts of hazardous substances (*see supra* n.67), renders the government's arranger liability for the Potrero Canyon facility of limited importance.

Perhaps recognizing the insufficiency of the government's safety manuals and inspector presence at the Sites, Lockheed argues that the government exercised such significant control over the Sites by virtue of its monopsony over the solid rocket propellant industry as to establish operator liability. (Trial Tr. at 31 (Lockheed opening); Lockheed Operator Br. at 1-2, 5-8.) In so arguing, Lockheed clings to a pre-*Bestfoods* Third Circuit decision where the government was found to be an operator for a contractor's facility based on its pervasive authority over both the site and the industry. (Lockheed Operator Br. at 1-2, 5-8 (citing *FMC Corp. v. U.S. Dep't of Commerce*, 29 F.3d 833 (3d Cir. 1994) (en banc).) In *FMC*, the en banc majority affirmed the district court's application of the "substantial control" test to hold the government was an operator of a high tenacity rayon production facility owned and operated by American Viscose during World War II. 29 F.3d at 843-45.[76]

Even assuming that *FMC* remains good law in the wake of *Bestfoods*,[77] this case does not present the pervasive levels of control exhibited in *FMC* and other World War II cases. *See, e.g.*,

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[76] The *FMC* en banc majority concluded that the government exercised significant day-to-day control over the American Viscose facility because

> American Viscose would not have been making high tenacity rayon if not at the government's direction. To obtain the commercial product it needed, the government diverted American Viscose from its previous commercial endeavors. Thus, every day American Viscose did what the government ordered it to do. Second, although the government officials and employees personally did not take over the plant, the government maintained a significant degree of control over the production process through regulations, on-site inspectors, and the possibility of seizure. Third, the government built or had built plants supplying raw materials to American Viscose, controlled these plants, arranged for an increased labor force, and supervised employee conduct, at least to the extent of helping American Viscose deal with labor disputes and worker absenteeism. Fourth, the government supplied machinery and equipment for use in the manufacturing process. Fifth, the government controlled product marketing and price.

29 F.3d at 844.

[77] The government argues that *Bestfoods* effectively abrogated *FMC*'s "substantial control" test. (Trial Tr. at 1809 (gov't closing).) Although the "substantial control" test is in tension with *Bestfoods*'s focus on a party's particularized control over hazardous waste disposal processes, *see Miami-Dade Cnty.*, 345 F. Supp. 2d at 1342, the Court need not decide if *FMC*'s remains good law.

Cadillac Fairview, 299 F.3d at 1022; *Shell Oil*, 294 F.3d at 1049-50.[78] The government's monopsony over the solid propellant rocket industry does not alone make the government an operator of the Sites. *See E. Bay Mun. Util. Dist. v. U.S. Dep't of Commerce*, 142 F.3d 479, 486 (D.C. Cir. 1998) (an output contract that "reflected the monopsonistic wartime market" did not make the government an operator). Indeed, important under *FMC* was not only the fact that the government created and held a monopsony over the high tenacity rayon market but also that it *forced* American Viscose to participate in that market *under the threat of takeover*. *FMC*, 29 F.3d at 844. There is no comparable evidence here. LPC voluntarily – and repeatedly – bid on, won, and completed significant government contracts and subcontracts.[79] *See E. Bay Mun. Util. Dist.*, 142 F.3d at 486-87 (concluding that the record lacked evidence that the government coerced plaintiff to operate mine).

[78] In *Cadillac Fairview*, "[t]he government owned the land; the government owned the plant; the government owned the raw materials; the government owned the byproducts and wastes; and the government owned the [product –] rubber." 299 F.3d at 1022. The government also had unrestricted control over its contractor's operations of the site, required monthly reports regarding hazardous waste disposal, and agreed to indemnify the contractor for all costs. *Id.* at 1022, 1026.

[79] Lockheed also cites the government's provision of government-owned equipment and raw materials, as well as putative control over personnel at the Sites, as evidence of the government's "pervasive" control. (Lockheed Operator Br. at 6-7.) The provision of government-owned equipment is of limited importance to *operator* liability when, as in this case, the government does not operate, no less control, that equipment. The same can be said for raw materials. Although the government's provision or aid in procuring the raw materials, such as AP, may be instructive for *arranger* liability, it is of limited importance in determining who directed waste disposal operations at the Site

Similarly, Lockheed's evidence that the government "exerted control over LPC's personnel" (Lockheed Operator Br. at 7) is unconvincing. In *FMC*, the government obtained draft deferrals for personnel, directed workers from other industries to the American Viscose plants, provided housing for the additional workers, resolved labor disputes, and had a full-time worker at the plant dealing with labor issues. 29 F.3d at 837. In this case, there is evidence that on two occasions over a span of twenty years the government made recommendations to LPC regarding personnel issues. (PX388 (recommending removal of an LPC employee who reworked a nozzle design without informing superiors); PX577 at 118 (recommending SPO negotiation of LPC's engineering workforce down by at least fifty percent upon commencement of SRAM production).) And there is no evidence that *either* recommendation was ever followed. (*See* Trial Tr. at 1377 (Dull) (noting the negotiations in PX0577 never took place).) Based on this limited evidence, the Court cannot conclude that the government exerted *any*, let alone pervasive, control over LPC's personnel.

Relatedly, while Lockheed's argument that the government determined "'what product the facility would produce, the level of production, the price of the product, and to whom the product would be sold'" (Lockheed Operator Br. at 8 (quoting *FMC*, 29 F.3d at 843)), is technically correct, it is ultimately irrelevant without evidence of government coercion. For LPC's argument, taken to its logical conclusion, would render the government an operator for practically *any military output contract*. Such a conclusion is inconsistent with *Bestfoods*'s requirement that operator liability is concerned first and foremost with control over "operations having to do with the leakage or disposal of hazardous waste," 524 U.S. at 66-67, and is expressly foreclosed by Circuit precedent. *See E. Bay Mun. Util. Dist.*, 142 F.3d at 486 ("[E]ntering into an output contract does not make the government an operator."). Thus, without evidence that the government coerced LPC to enter into its solid propellant rocket contracts, the *general terms – e.g.*, product, quantity, and price – of those contracts cannot form the basis of a finding of operator liability. *See Rospatch Jessco Corp. v. Chrysler Corp.*, 962 F. Supp. 998, 1005-06 (W.D. Mich. 1995) (the government was not an operator where it did not "twist [the] arm" of contractor to produce wartime materials, and the government's control over site was limited to process specifications and inspections).

Accordingly, considering the totality of the circumstances, the Court concludes that the government was not an operator of the Sites. To be sure, all of LPC's operations at the Sites were in performance of government contracts or subcontracts and the government had a pervasive influence over general activities at the Sites, whether through process specifications, safety manuals, inspections, or technical direction. However, the government did not manage, direct, or otherwise control on a frequent basis the day-to-day hazardous waste disposal activities at the Sites. *See Coeur D'Alene Tribe v. Asarco Inc.*, 280 F. Supp. 2d 1094, 1127-30 (D. Idaho

2003) (government is not liable as an operator in case with "pervasive involvement of federal government" including knowledge of "how the waste material was disposed of and that it was done in accordance with the customary and usual practices of the time" because the "federal government did not make the day-to-day decisions regarding operations of [disposal]"); *United States v. Iron Mountain Mines, Inc.*, 987 F. Supp. 1277, 1287-88 (E.D. Cal. 1997) (same). Because LPC was the sole operator of the Sites under *Bestfoods*, the Court concludes that Lockheed should shoulder a large proportion of the liability for response costs at the Sites.

C. The government acquiesced in many of LPC's disposal operations at the Sites.

That the government was not an operator of the Sites under *Bestfoods* does *not*, however, shift the entire equitable allocation to Lockheed. Although evidence that a party knew of another's disposal practices is insufficient to impose either operator or arranger liability, *see, e.g.*, *Burlington N.*, 556 U.S. at 610 (arranger); *Coeur D'Alene Tribe*, 280 F. Supp. 2d at 1127-30 (operator), courts often consider the "acquiescence of the parties in the contaminating activities" as a factor in equitable allocation. *See, e.g.*, *Weyerhaeuser*, 771 F. Supp. at 1426; *see also Cadillac Fairview*, 299 F.3d at 1025.

Even though the government did not direct or control LPC's day-to-day hazardous waste disposal activities at the Sites, it *was* aware of and acquiesced in many of them. The government contracted with LPC (and Boeing) with the knowledge that "[d]isposal . . . should be regarded as an integral part of solid propellant rocket operations" (PX0009 § 7-1.1 (1973 Air Force Manual); *see also* PX431 ("[LPC] will generate under normal operations approximately 10,000 pounds of waste materials per month."), and wrote the manuals that provided general recommendations for waste propellant disposal procedures. (*See, e.g.*, PX0007; PX0009.) It would be inequitable for the Court to allocate to Lockheed full responsibility for the response costs at the Sites when the

government could have anticipated, and in some instances knew, how LPC disposed of the TCE and propellant wastes created during the performance of its government contracts. *See Weyerhaeuser*, 771 F. Supp. at 1424-26. Thus, the Court will allocate the government an equitable share based on its acquiescence.

That said, the level of government acquiescence varied among the Sites. Government presence and acquiescence was at its greatest at the Redlands facility. The full-time DCAS representatives were located there, the majority of DCAS inspection points were located there, and the inspections (safety and otherwise) focused on operations there. (*See* Trial Tr. at 1357; *e.g.*, PX476 at 109.) Even though the government's technical observers and DCAS inspectors were not *focused* on the ultimate acts of disposal at Redlands – *e.g.*, evaporation pits and burn pits – it is improbable that the government representatives were unaware of how Lockheed managed its wastes. Indeed, there is direct evidence that government representatives at least knew of both LPC's use of evaporation pits (*e.g.*, PX471 at 1) and burn pits at Redlands. (*E.g.*, Trial Tr. at 1380 (Dull); PX453.)

Government presence was lower, but still significant, at the Potrero Canyon facility. While DCAS inspections focused on the Redlands facility, they also covered some of the production operations at the Potrero Canyon facility. (*See, e.g.*, PX474; PX476 at 109; PX0479 at 304.) The government also knew of LPC's burn pit operations at the Potrero Canyon facility and on several occasions it instructed LPC to burn abandoned government property there. (*See* PX0461; PX1073 at 1; *see also supra* n. 75.) Further, although there is no evidence that the government directed LPC to hog out defective rocket motors, the government was aware that LPC was using this procedure. (*See* Trial Tr. at 1352 (Dull); PX326 at 3; PX550 at 46.).)

The government had the least involvement with the LaBorde Canyon facility. The government knew of and probably observed a significant number of rocket motor tests in the Test Bay Canyons. The government also knew, to the extent it occurred at the LaBorde Canyon facility, that LPC hogged out defective rocket motors to reuse the casings. (*See* Trial Tr. at 1352 (Dull); PX326 at 3; PX550 at 46.).) However, there is little evidence of government inspections – safety or otherwise – at LaBorde Canyon facility. There is also no evidence that the government had any oversight over the Waste Disposal Area.

D. Some of LPC's disposals at the Sites violated internal LPC rules or government requirements

Of course, the government did not know of and acquiesce in all of LPC's disposal practices, including many that are sources of the contamination at the Sites. Indeed, in several instances LPC violated its own internal rules or a rare government requirement with regard to the handling and disposal of waste solvents and propellants. The Court focuses only on three violations that best demonstrate LPC's lack of due care at the Sites. Whether a result of inadequate training, poor oversight, or sloppy practices in general, these instances favor an upward adjustment to Lockheed's equitable allocations for the Redlands and Potrero Canyon facilities.[80]

The disposal of TCE on the bare ground at the Redlands facility (*see supra* Section I.A.2) is the most prominent example of LPC employees violating LPC's rules. As the Court has

[80] This consideration falls within the fifth Gore factor – "the degree of care exercised by the parties with respect to the hazardous waste concerned." *Envtl. Transp. Sys.*, 969 F.2d at 508. Under that same factor, the Court has previously concluded that LPC did not violate any *generally recognized* standard of care by pouring liquid TCE or propellant wastes, or burning propellant wastes, on the bare ground. (*See supra* Section II.A.6.) Here, the Court asks the different question of whether LPC failed to live up to its *own* rules or shirked any government requirements. Just as the government should have been able to rely on LPC to operate according to generally recognized standards of care, the government should have been able to rely on LPC to follow its own rules and any relevant government requirements.

concluded, pouring TCE and other solvents on the bare ground did not violate any standard of care generally recognized in the 1950s through mid-1970s. (*See supra* Section II.A.6.) Nonetheless, recognizing the safety risks of pouring AP-contaminated solvents on the bare ground, LPC constructed evaporation pits for the disposal of solvent wastes. (Trial Tr. at 95, 99 (Oppliger); USX977 at 48-49 (Stickney Dep.).)[81] LPC memorialized its policy for the collection of solvents and disposal in evaporation pits in its Standard Operating Procedure 11 ("SOP-11"). (*See* PX961.) SOP-11 stated, *inter alia*, that "[a]t no time are solvents to be poured on the ground or in the water [settling] basin south of Bldg. 114." (*Id.* at 2.) Several witnesses testified that SOP-11 was more than hortatory. Mr. Oppliger testified that, even though he did not manage waste disposal processes, he would have "definitely" stopped LPC employees from dumping solvent on the bare ground because such disposals were "dangerous" and "would not be allowed." (Trial Tr. at 95, 99, 108-10 (Oppliger).) Similarly, Mr. Donald Eastman, who worked as a process operator and later as foreman at LPC from 1956 to 1974, testified that he was "indoctrinated" to "not dump chemicals in the ground." (USX895 at 5-9, 106-07 (Eastman Dep.).) Nonetheless, whether as a result of inadequate training (*E.g.*, USX987 at 21 (Wessman Dep.), poor oversight (*e.g.*, *id.* at 26), or sloppy practices, several LPC employees testified to routinely violating SOP-11. Had LPC better enforced SOP-11, some portion of the TCE contamination in the Redlands plume probably could have been prevented.

Second, LPC's washing of grinder parts and bags into Building 77's south sump at the Redlands facility (*see supra* Section I.A.1) also violated the company's internal protocols. As Mr. Delaney opined, LPC's process specifications treated "AP-contaminated wastewater . . . no differently than dry AP." (Delaney Decl. ¶ 24.) Although the process specifications for washing

[81] After the mid-1960s, LPC no longer used evaporation pits for solvent wastes, but instead it sent contaminated solvents directly to burn pits. (*See* Trial Tr. at 808-09 (Feenstra).)

grinder parts and bags *did not* specify how to treat AP-contaminated wastewater from grinder part and bag washing (*see* USX32 § 1.3), manufacturing process standards pertaining to Building 77 specifically stated that AP-contaminated "water is to be discarded as waste propellant." (PX1023 § 6.31.1; *see also* PX1043 §100.6.5 ("Label and treat the drum of [contaminated] water as waste propellant.").) Under LPC's safety standard for propellant wastes, waste propellant was to be collected in drums and transported to the burn pits. (*See* PX1061 at 885-87.) As Mr. Oppliger testified, disposal of AP-contaminated wastewaters onto the bare ground "would not be allowed." (Trial Tr. at 95 (Oppliger).) Had this admonition been followed, a substantial portion of the perchlorate contamination in the Redlands plume probably could have been prevented.[82]

Third, LPC's burial of propellant wastes constituted a clear violation of a government requirement.[83] While the government *did not* mandate any specific method for LPC's disposal of propellant wastes (*see supra* Section II.B), it did *explicitly proscribe* the disposal of solid propellant wastes by burial. (*See* USX47 § 2704 (1951 Army Safety Ordnance Manual) ("Collected explosive wastes *must* not be disposed of by being buried . . . ." (emphasis added)).) At some point prior to 1963, LPC violated this government proscription by burying propellant wastes at the Potrero Canyon facility. (*See* USX55.)[84] The record provides no indication where

[82] The foregoing conclusion also applies to the LPC employees' release of AP-contaminated wastewaters onto the bare ground after washing down the interiors of buildings. (*See supra* Section Section I.A.1.) However, it *does not* apply to LPC's hog out operations. Although hogging out defective rocket motors onto the bare ground did violate LPC's general protocol regarding the disposal of AP-contaminated wastewaters, the Court does not consider this violation to be of significance because the government was aware of the process. (*See supra* Section II.C.)

[83] Additional violations of LPC protocols and government recommendations regarding AP wastes included pouring of propellant scraps and wastewater directly into burn pits rather than burning them in drums (*compare* USX1002A.0001 (Wright Decl.), *with* PX0009 § 7-2, 7-3 (recommending propellant cuttings in water to be burned in drums); PX961 (SOP-11)), and the failure for several years to connect the pipe between Building 52 to Evaporation Pit 61. (*See supra* Section I.A.1.)

[84] Lockheed claims that LPC buried "inert propellants" at the Potrero Canyon facility. However, the fact that in 1963 LPC was concerned about the presence of the buried propellants "in the watershed"

LPC buried these wastes, how much was buried, whether the wastes were ever removed, or whether the wastes contributed to the perchlorate contamination at the facility. (*See* Sterrett Decl. ¶ 223.) Nonetheless, LPC's flagrant violation of the Safety Ordnance Manual necessitates a slight upward adjustment in Lockheed's equitable allocation for the Potrero Canyon facility.

E. Conclusion under traditional equitable allocation

Based on these above findings of facts and conclusions of law, were the Court to end its equitable analysis here, it would allocate liability for response costs (pasts and future) at the Sites as follows: at the Redlands facility, a 30% share of liability for the government and a 70% share of liability for Lockheed; at the Potrero Canyon facility, a 25% share of liability for the government and a 75% share of liability for Lockheed; and at the LaBorde Canyon facility, a 20% share of liability for the government and an 80% share of liability for Lockheed.

III. EFFECT OF INDIRECT RECOVERIES ON EQUITABLE ALLOCATION

However, no analysis can be complete without consideration of the novel issue of what effect, if any, Lockheed's indirect recovery of significant percentages of its response costs for the Sites through U.S.-government contracts should have on the Court's equitable allocation of those same response costs between the Lockheed and the government. Lockheed urges that its indirect recoveries from the government should have no effect on its ability to recover directly from the government under CERCLA. In contrast, the government argues that allocating it a CERCLA share would amount to impermissible "double recovery." Because of the significant economic and legal distinctions between past and future response costs, the Court considers their allocations separately.

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and considered it necessary to "mark[] with some type of pole or flag" the location of the propellants in preparation for construction leads the Court to conclude that not all of the buried propellants were inert. (USX55.)

A. Lockheed's recovery of past response costs would unfairly burden the taxpayer.

Lockheed has indirectly recovered from the government through higher contract prices over 72% of its past response costs for the Sites. (Meyer Decl. ¶ 29 & fig. 5.) Thus, the government's "effective share" is already well over two times higher than its equitable share for the Sites as determined in Section II.E. Moreover, based on the most recent data on the U.S.-government share of Lockheed's business, U.S.-government contracts would receive the benefit of only 87% of any CERCLA payment made by the government for past response costs.[85] (Wright Decl. ¶ 74; *see* Trial Tr. at 1677-78 (Gatchel).) Thus, any allocation payment made by the United States would cause their effective share to rise even further beyond their equitable share. This, the government argues, is double recovery. (*E.g.*, Trial Tr. at 1891 (government closing).)

"CERCLA expressly prohibits double recovery for response costs." *Boeing Co. v. Cascade Corp.*, 920 F. Supp. 1121, 1133 (D. Or. 1996). However, this prohibition is fairly narrow, in that it only applies to bar CERCLA recovery for costs already compensated "under any other Federal or State law." 42 U.S.C. § 9614(b). Because of the narrowness of the statutory bar on double recovery, courts have developed a broader *equitable* double recovery theory based on the principle that "permitting a CERCLA contribution-action plaintiff to recoup more than the response costs he paid out of pocket flies in the face of CERCLA's mandate to apportion those costs equitably among liable parties." *Friedland*, 566 F.3d at 1207. The theory

[85] Under the DiscOps Pool, the government benefits from the same percentage of credits in a given year as it incurs costs – a feature Lockheed refers to as the "mirror image" principle. (*See* Trial Tr. at 1679 (Gatchel).) Thus, if Lockheed recovered $69 million of its past response costs for the Redlands facility from the government pursuant to this action (30% of Lockheed's $231 million in total past response costs for the facility), under the current Lockheed contract mix, only 87% ($60 million) would pass through as credits to benefit U.S.-government contracts. The remaining 13% ($9 million) would pass through as credits to the benefit non-U.S. government contracts. (Wright Decl. ¶ 74; *see* Trial Tr. at 1678 (Gatchel).)

also comports with the concept that "the environment is the injured party, not the plaintiff." *United Alloys, Inc. v. Baker*, 797 F. Supp. 2d 974, 1002 (C.D. Cal. 2011). "In other words, Plaintiffs have not been damaged and are not 'entitled' to money as a damaged party; but rather, *Plaintiffs can only receive reimbursement for the costs they expended beyond their share of actual responsibility for the environmental damage*." *Basic Mgmt. Inc. v. United States*, 569 F. Supp. 2d 1106, 1124 (D. Nev. 2008) (emphasis added). Plaintiffs "cannot make a profit on the contamination." *Vine St.*, 460 F. Supp. 2d at 765. The effect of an equitable bar on double recovery is simple: if a party has recovered from a collateral source, the amount of that recovery is subtracted from the total pool of allocable costs.

Courts have applied equitable principles to bar double recovery in circumstances where plaintiff-PRPs have received payouts from insurers, *see, e.g.*, *Yankee Gas*, 852 F. Supp. 2d at 255-56; *Basic Mgmt.*, 569 F. Supp. 2d at 1125; formal settlements with other PRPs, *see, e.g.*, *K.C.1986 Ltd. P'ship v. Reade Mfg.*, 472 F.3d 1009, 1017 (8th Cir. 2007); and informal payments from other PRPs. *See, e.g.*, *Vine St.*, 460 F. Supp. 2d at 766 (so holding even though, under the agreement, plaintiff had promised to pay back the PRPs for all reimbursements received). However, as Judge Robertson correctly observed, those cases are distinguishable from this case because they all considered *direct* payments to the plaintiff that, if not taken into account, could amount to a windfall for the plaintiff. *Lockheed Martin Corp.*, 664 F. Supp. 2d at 19.

In that vein, Lockheed argues that this case is more analogous to the utility rate recovery cases where courts have concluded that double recovery is not an equitable concern. *See Yankee Gas*, 852 F. Supp. 2d at 256; *N.Y. State Elec. & Gas Corp. v. FirstEnergy Corp.*, 808 F. Supp. 2d 417, 528-29 (N.D.N.Y. 2011). In those cases, plaintiff-utilities formally recovered their response

costs through increased rates charged to ratepayers. The defendants in both cases argued that the recovery of response costs from ratepayers should equitably bar plaintiffs' recovery of those response costs under CERCLA, lest the plaintiffs receive a windfall. *See Yankee Gas*, 852 F. Supp. 2d at 256; *FirstEnergy*, 808 F. Supp. 2d at 528. Both courts disagreed, concluding that the plaintiffs' recoveries from defendants posed no large risk of double recovery or windfall. *Yankee Gas*, 852 F. Supp. 2d at 256; *FirstEnergy*, 808 F. Supp. 2d at 529. As the *Yankee Gas* court explained:

> Money recovered from [defendant] will allow DPUC to reduce the amount it allows Yankee Gas to collect from its utility customers during future rate cycles. Thus, money contributed by UGI is money that will not have to be paid by utility customers in Connecticut. The "windfall," if that is the word, goes to the rate payer, not Yankee Gas. This is in keeping with "CERCLA's goals of cleaning up environmental contamination and making sure that responsible parties, *rather than taxpayers*, bear the costs."

852 F. Supp. 2d at 256 (quoting *Marsh*, 499 F.3d at 182) (emphasis in original).

This case, however, is distinguishable from *Yankee Gas* and *FirstEnergy*. Here, the principal "ratepayer" and the defendant-PRP *are one and the same* –the U.S. government. In such circumstances, careful consideration of the recovery crediting scheme is necessary to ensure that the plaintiff does not benefit from double recovery at the expense of the taxpayer. *See R.W. Meyer*, 932 F.2d at 572 ("'The hallmark of a court of equity is its ability to frame its decree to effect a balancing of all the equities and to protect the interest of all affected by it, including the public.'" (quoting *Kay v. Mills*, 490 F. Supp. 844, 855 (E.D. Ky. 1980)).

The DiscOps Pool's crediting mechanism attempts to prevent "double recovery," at least as traditionally understood. Lockheed *must* allocate its CERCLA response cost recovery to the DiscOps Pool (*see* USX1033 ¶ 4.7), and credits in the DiscOps Pool are passed through Lockheed's contracts in the same way as costs. (Trial Tr. at 1678 (Gatchel).) As in the utility rate recovery cases, one hundred percent of any CERCLA recovery ultimately flows to the

ratepayers (*i.e.*, the U.S.-government and Lockheed's other clients) and not Lockheed. Thus, there is no "double recovery" in the traditional sense because Lockheed cannot recover more in *response costs* than it initially paid, and there is little potential for a windfall to the plaintiff from the crediting system. (*Cf. id.* at 594-95 (Wright).)

To be sure, under *any* scenario where the government is allocated an equitable share of past response costs, it will be worse off and shoulder a larger "effective share" of Lockheed's response costs than it does now.[86] (Meyer Decl. ¶ 33.) But an increase in the government's "effective share" does not alone amount to a "double recovery." For "double recovery" focuses on the projected post-recovery economic position of the plaintiff, *not* the defendant. *See Friedland*, 566 F.3d at 1207 (framing the issue as whether the plaintiff "recoup[s] more than the response costs he paid out of pocket").

Moreover, the government has been complicit in designing the very system about which it so bitterly complains. The FAR allows indirect costs to be charged to government contracts and the DCAA has taken the position that environmental cleanup costs at discontinued sites generally constitute indirect costs. (*See* PX1862 ¶ 7-2120.7.) More importantly, in 2000, the government negotiated with Lockheed and signed the DOSA, which blessed the DiscOps Pool and its cost allocation and crediting scheme *and* explicitly stated that it did not settle any claims arising under CERCLA. (USX1033 ¶ 4.18.) The DOSA also recognized the coexistence of indirect contract and direct CERCLA recoveries by disallowing certain costs and credits from – rather than nullifying wholesale – the *Burbank* Consent Decree. (*Id.* ¶¶ 3.1-.3.) All the while, the government agreed, both pre- and post-DOSA, to toll the CERCLA statute of limitations for the

[86] In nominal terms, and without accounting for taxes levied on Lockheed profits, the detriment to the government of a CERCLA allocation for past costs can be expressed as: Detriment = (1 – recovery rate from U.S. government) x Equitable Allocation x Past Response Costs.

Redlands facility, while allowing Lockheed to indirectly recover response costs through U.S.-government contracts.

Under these facts, the government cannot fairly assert, as it seems to here, that it was blindsided by Lockheed's decision to file a CERCLA claim for the Sites or that DOJ should not be bound by DOD's decisions regarding government procurement contracting.[87] Nor will the Court in equity save the government from the natural and probable consequences of its own conduct. Thus, the Court finds that there is no "double recovery" in this case and that – all other things being equal – it would not be inequitable for the government's effective share of past response costs to increase as a result of Lockheed's recovery of response costs from the government under CERCLA.

Double recovery aside, the Court is nonetheless concerned about the *economic benefit* to Lockheed and the economic detriment to the taxpayers from any CERCLA recovery of past costs in this case. Framing the issue as one of economic benefit rather than double recovery serves the important purpose of preventing Lockheed from profiting from CERCLA – beyond the mere recovery of response costs – at the expense of the taxpayer.[88]

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[87] Importantly, *Burbank* Consent Decree – signed by DOJ –explicitly recognized the possibility of an agreement like the DOSA, which was signed only months later by Lockheed and DCAS. (*See* PX1844 ¶ 3.25; USX1033.) The DOJ also signed the CERCLA tolling agreements applicable to the Redlands facility, including one agreement that was executed less than two months before the DOSA was signed. (*See* PX1849.)

[88] In its closing rebuttal argument, Lockheed cited *TRW, Inc. v. United States*, 28 Fed. Cl. 155 (Fed. Cl. 1993), in support of its position that the government cannot avoid its obligation to make *direct* payments under the law on the basis that it had already made *indirect* payments through government contracts regarding the same contractor costs. (Trial Tr. at 1966-68 (Lockheed closing.) In *TRW*, a contractor sought to recover from the government $2.9 million in bid and proposal ("B & P") costs associated with preparing a bid proposal for an IRS request for proposals on the ground that the IRS did not consider the proposal "fairly and honestly." 28 Fed. Cl. at 156-57. The government argued that the contractor had indirectly recovered $2.1 million of those B & P costs through advance agreements with the DOD. *Id.* at 157. The court denied the government's motion for summary judgment because, under the advance agreement accounting system, the contractor would have received the same total in payments whether or not it had bid on the IRS proposal. *Id.* at 160. In essence, the government failed to

In this regard, the Court credits Dr. Meyer's opinion that economic benefit should be analyzed from the *status quo – i.e.*, the parties current, pre-allocation positions based on the response costs incurred and indirect recoveries made over the past twenty years. (Meyer Decl. ¶¶ 54-57, 138-39.)[89]

Aside from having already indirectly recovered far more of its response costs through U.S.-government contracts than the government's equitable allocation for the Sites, Lockheed has also benefitted significantly by charging the government a profit factor on those response

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demonstrate that it had indirectly paid the contractor $2.1 million dollars for the relevant B & P costs. *Id.* at 162. This case is inapposite here. First, it is undisputed that Lockheed has indirectly recovered from the government over $200 million in response costs associated with the Sites, thus undermining the *accounting* basis for the TRW decision. It is not clear what would have happened in *TRW* had the government proven that the contractor had indirectly recovered $2.1 million of the relevant B & P costs through advance agreements with the DOD. Second, and more importantly, the *TRW* court was not considering how to equitably allocate liability between two responsible parties.

[89] Mr. Kiefer criticized Dr. Meyer's definition of the *status quo* as the baseline for economic benefit analysis and seemed to suggest that the proper analysis would compare Lockheed's comparative economic benefit under a CERCLA recovery with the hypothetical baseline assuming the government had directly reimbursed Lockheed for its equitable share as the costs were incurred. (*Cf.* Trial Tr. at 1580 (Kiefer); Kiefer Decl. ¶¶ 3-4.) The Court rejects Mr. Kiefer's proposed baseline for several reasons. First, it is common practice in an economic benefit analysis to use a *status quo* baseline. This is so because economic benefit analyses addressing hypothetical futures are most useful when compared to real, present-day conditions rather than hypothetical past occurrences. (*See* Trial Tr. at 1512 (Meyer); Meyer Decl. ¶ 138.) Indeed, as a practical matter, Mr. Kiefer's baseline would have required, as early as 1994, the government to have known and directly reimbursed Lockheed for its equitable share of costs – the very issue before this Court some twenty years later.

Second, Mr. Kiefer provides no quantitative analysis to defend his "conceptual" opinion that, when compared to his proposed baseline, Lockheed would not receive an economic benefit from a CERCLA recovery. (Trial Tr. at 1573-75 (Kiefer).) Although Mr. Kiefer testified that he "believe[d] it would be possible" to perform a quantitative analysis supporting his conceptual opinion, Lockheed did not ask him "to make an affirmative calculation of economic impact." (*Id.* at 1574.) Finally, Dr. Meyer's analysis, even though using a *status quo* baseline, *does* take into account what has happened in the past: that Lockheed incurred costs and recovered them (plus a profit) on an amortized basis. (Trial Tr. at 1512-13 (Meyer).) Because it neither ignores the past nor relies on unrealistic hypotheticals, the Court concludes that Dr. Meyer's *status quo* baseline provides the most equitable framework for determining how much a CERCLA recovery benefits Lockheed.

costs.[90] Mr. Wright estimated this pre-tax profit factor to be six percent. (Wright Decl. ¶ 85; *see also* Meyer Decl. ¶ 101 n.52.) Lockheed's public filings, however, reveal significantly higher pre-tax profit margins over the years. (*See* USX383.0030 (9.0% for 1998, 8.2% for 1996, 8.5% for 1996); USX397.0030 (9.4% for 2012, 8.6% for 2011, 9.0% for 2010, 10.2% for 2009, 11.7% for 2008).) Even assuming Mr. Wright's conservative six-percent profit markup, Lockheed effectively recovered at the expense of the taxpayers six cents on every dollar of its response costs passed on to U.S.-government contracts. (*See* Wright Decl. ¶ 84.) All told, these pre-tax profits amounted to approximately $11.8 million in nominal dollars (*see* USX433A.0007-08), or adjusting for the time value of money, approximately $17.2 million in net present value terms. (*Id.* at 0012-13.)

Mr. Kiefer opined, without conducting any quantitative analysis, that any recovery from the government in this case would cancel out past profits because credits reduce profits in the same way that costs create profits. (*See* Kiefer Decl. ¶¶ 32-33; *cf.* Meyer Decl. ¶¶ 42, 160 ("[T]he credit associated with the CERCLA payment results in lower profits for [Lockheed] (from lower costs passed through to contracts with the United States)."). However, as Lockheed admits (Trial Tr. at 1966 (Lockheed closing)), this argument ignores an important component – the significant time value of money benefits (over $5 million pre-tax) that accrued to Lockheed from its past profits on indirect recoveries from the government.

Mr. Kiefer faulted the government for not directly paying its share of response costs all along and opined that the government's unwillingness to pay directly for response costs in the past harmed Lockheed. (*E.g.*, Kiefer Decl. ¶¶ 3-4; Trial Tr. at 1579-83 (Kiefer).) The facts do not support Mr. Kiefer's conclusion. Lockheed's historical rate of indirect recoveries from the

[90] Lockheed identifies as its "underlying tenet in pricing [its] contracts with the U.S. government" as its "ability to recover [its] costs *plus profit*, regardless of the type of contract." (USX407 at 4-5 (emphasis added).)

government – which again is many times higher than the government's equitable allocations for the Sites – and the time value of the substantial profits that Lockheed has realized on these indirect recoveries, make it difficult, if not impossible, to conclude that Lockheed has been injured by the government's lack of *direct* payments over the last twenty years. Quite the opposite, in fact. Lockheed has benefitted greatly by recovering more money related to response costs (due to its profit factor) than it has spent.[91]

Of course, profiting off of the cleanup of hazardous wastes is not *per se* undesirable or improper. CERCLA's bona fide prospective purchaser exemption, 42 U.S.C. § 9607(r)(1), makes clear that, in some instances, cleanup of hazardous wastes *should* be a profitable enterprise, lest no one voluntarily undertake the important task. *See* Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107–118, 115 Stat. 2356 (2002) (providing an array of CERCLA amendments intended "to promote the cleanup and reuse of brownfields"). However, courts have consistently considered as an equitable factor the "economic benefits realized by a party as a result of remediation efforts." *City of Wichita*, 306 F. Supp. 2d at 1101 (collecting cases); *see also FirstEnergy*, 808 F. Supp. 2d at 533; *Litgo*, 2011 WL 65933, at * 9. And CERCLA provides no indication that *responsible parties* should *profit* from the cleanup process at the expense of other *responsible parties*. *Cf. Vine St.*, 460 F. Supp. 2d at 765.

[91] Lockheed attempts to rebut this conclusion by suggesting, through the testimony of Mr. Gatchel, that it lost contracts due to "overall cost," including environmental response costs. (Trial Tr. at 1674 (Gatchel).) However, Mr. Gatchel did not identify any specific contract that Lockheed lost because of environmental response costs at the Sites. Without such evidence, the Court will not credit Lockheed's argument that response costs for the Sites – even totaling tens of millions of dollars annually – caused Lockheed to lose any government contracts, especially given Lockheed's annual net sales of over $45 billion in each of the past five years. (*See* Press Release, *supra* n.22 (2013); USX397.0002 (2012); USX396.0002 (2011); USX395.0002 (2010); USX394.0002 (2009).)

Were the economic benefit to Lockheed limited to the time value of the profits it has already earned on indirect recoveries through its U.S.-government contracts, the Court might not be inclined to exempt the government from paying an equitable share of the past response costs at the Sites. For as Lockheed contends, it merely seeks to recover as much of its past response costs as possible under CERCLA to reduce costs for its clients and improve its own competitive position. (*See* Trial Tr. at 1667-68 (Gatchel).) However, even accepting these motives, Lockheed will receive three significant windfalls – all at the expense of the taxpayers – if the Court allocates the government an equitable share of past response costs.

First, as the parties agree, CERCLA § 107(a) mandates the award of prejudgment interest.[92] 42 U.S.C. 9607(a)(4)(D); *see K.C.1986 Ltd. P'ship*, 472 F.3d at 1018. This statutory requirement applies with equal force when – as here – a plaintiff has sued under § 107(a) and the defendant counterclaims under § 113(f). *See Litgo*, 725 F.3d at 392; *Bancamerica Commercial Corp. v. Mosher Steel of Kansas, Inc.*, 100 F.3d 792, 799-801 (10th Cir. 1996). The purpose for awarding prejudgment interest was clearly explained by the Tenth Circuit:

> Failure to grant prejudgment interest on contribution awards may . . . result in *inequitable* apportionment, because parties awarded contribution will still have lost the time value of the money they spent on behalf of other liable persons, and those persons will have gained an equal amount. Further, refusal to grant prejudgment interest is a disincentive for private parties to voluntarily undertake cleanup actions because they will lose the time value of the money they spend on behalf of other persons. Indeed, it would create a perverse incentive for responsible parties to delay involvement in cleanups, because as they delay, they gain the time value of the funds they should be investing in the cleanup.

Bancamerica Commercial Corp., 100 F.3d at 801.

This case, however, implicates *none* of these policy concerns. There is no loss based on the time value of money because Lockheed indirectly recovered from the government *much*

[92] *See* Lockheed Memo. on the Availability of Prejudgment Interest, Feb. 20, 2014 [Dkt. No. 128] at 1-3; Trial Tr. at 1454 (government counsel).

more than the government's equitable share of the response costs for the Sites through U.S.-government contracts *as it incurred the costs*.[93] Nor would the lack of prejudgment interest in this case have disincentivized cleanup efforts. Lockheed was ordered to clean up the Sites by the California environmental authorities and, in any event, it was able to indirectly recover its response costs (plus a healthy profit) from the U.S. government and its other clients as it incurred them. Indeed, as the Court has already explained, Lockheed actually *benefitted* from its cleanup efforts through the profits it gained on the response costs that flowed down to its U.S.-government contracts. For these reasons, the purposes of prejudgment interest are inapplicable to this equitable allocation case.

A rough calculation of the amount of prejudgment interest potentially available in this case only further underscores the Court's conclusion. Assuming a demand date in 2000,[94] and that all of Lockheed's past responses costs qualify for recovery under CERCLA, the potentially available prejudgment interest in this case totals over $61 million dollars – over 20% of Lockheed's total past response costs for the Sites.[95] Applying the Court's above-determined

[93] Of course, Lockheed's amortization of response costs over five years has time value of money implications. Both parties lament, in their own way, the "interest free loans" they provided each other during the respective cost and credit amortization periods in the DiscOps Pool. (Kiefer Decl. ¶¶ 25-26; Meyer Decl. ¶ 60.) However, because both parties benefit from amortization – through cost smoothing, increased predictability in multi-year contracts, and increased contractual uniformity and comparability – the Court considers the issue of amortization to be a wash. (*See* Mateer Decl. ¶ 9; PX1859 at 3-4.)

[94] Prejudgment interest accrues under CERCLA "from the later of (i) the date payment of a specified amount is demanded in writing, or (ii) the date of the expenditure concerned." 42 U.S.C. § 9607(a)(4). Lockheed represented in its memorandum on prejudgment interest that it sent a CERCLA demand letter to the government in December 2000. (Lockheed Memo. on Prejudgment Interest at 2 & n.1; *cf.* PX2063 (draft of demand letter).)

[95] The Court calculated the potentially available prejudgment interest (assuming a 100% allocation to the government) for a given year using that year's response costs for the Sites (*see* Meyer Decl. ¶ 50 fig. 29) and compounding interest from that year through 2013 using the variable Superfund interest rates. (*See* USX427.) (Costs prior to 2000 were aggregated and treated as all having been incurred during 2000.) The Court then summed the potentially available prejudgment interest for each year's response costs to reach an estimated total potentially available prejudgment interest of over $61

equitable allocations for the Sites (*supra* Section II.E), the government would owe Lockheed over $18 million in prejudgment interest.[96] Critically, there is *no* evidence – and Lockheed has expressly declined to provide any assurance – that this $18 million in prejudgment interest would be allocated to the DiscOps Pool and thus partially (87%) credited back to U.S.-government contracts. (Trial Tr. at 1455 (Lockheed counsel); *id.* at 1878 (Lockheed closing).) Instead, the $18 million in prejudgment interest would amount to a bonanza for Lockheed.

Lockheed would additionally benefit from a recovery of past response costs because between 40 and 50% of Lockheed's existing government contracts are fixed-price. (Trial Tr. at 1661 (Gatchel).) These pre-judgment fixed-price contracts are of varying terms and were negotiated *without* the expectation of a large lump sum CERCLA recovery for past costs. (*Id.* at 1661, 1680.) Although Lockheed's business units will flow credits from any recovery down to existing fixed-cost contracts, these credits will reduce Lockheed's indirect costs on the contracts but will not reduce the price Lockheed realizes from the U.S. government-as-client. (*Id.* at 1679.) Thus, the credit does not functionally accrue to the government, but instead amounts to additional profit for Lockheed. (*Id.* at 601-04 (Wright); *id.* at 1679-80 (Gatchel).)

Of course, fixed-price contracts entered into after an allocation of past costs to the government in this case presumably would account for upcoming amortized credits from the DiscOps Pool, and many pre-judgment fixed price contracts would terminate during the five-year

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million. This methodology is consistent with Dr. Meyer's methodology that calculated a total potentially available prejudgment interest of just over $66 million, except that she used a demand date of 1994, which is inconsistent with CERCLA § 107(a)(4)(D). (*See* Trial Tr. at 1518 (Meyer); Meyer Decl. ¶ 144.)

[96] The Court conservatively calculated the government's exposure by calculating prejudgment interest available by facility (using facility-specific response costs up through 2011) according to the procedure described above (*supra* n. 95) and multiplying each facility's potentially available prejudgment interest by the government's equitable allocation for that facility's response costs. (*See supra* Section II.E.) The Court then summed the results for each facility to estimate the government's total prejudgment interest exposure under the Court's traditional equitable allocation.

amortization period following a CERCLA recovery of past costs. However, Mr. Gatchel estimated that over ten percent of pre-judgment fixed-price contracts would remain in effect over the entire five-year amortization period. (*Id.* at 1680-81 (Gatchel).) The record before the Court is insufficient to establish with any precision how much Lockheed would benefit from a CERCLA recovery of past costs due to this incompatibility between the DiscOps Pool crediting scheme, unanticipated credits, and fixed-price contracts. Nonetheless, the available evidence makes clear that the benefits for Lockheed would be substantial and at the expense of the taxpayer.

Third, the Court is swayed by the fact that the taxpayers have already underwritten a substantial portion of Lockheed's suit by indirectly paying for over 85% of Lockheed's more than $10 million in expert and legal fees and other costs. (*See* Meyer Decl. ¶ 172.) This result flies in the face of CERCLA's prohibition against "the award of private litigants' attorney's fees associated with bringing a cost recovery action." *See Key Tronic Corp. v. United States*, 511 U.S. 809, 819 (1994). While FAR § 31.205-47 may allow Lockheed to recover its legal fees and costs through government contracts, that outcome is contrary to both CERCLA and the interests of the taxpayer. Thus, although it is beyond both the Court's jurisdiction and the scope of this case to disallow Lockheed's legal fees and costs associated with bringing this action, the Court considers it equitably important that the taxpayers are on the hook for over 85% of Lockheed's costs incurred in this action which, as concluded above, would result in further substantial costs to the taxpayers and accrue to the benefit of Lockheed.

Accordingly, considering the totality of the circumstances, the Court concludes that it would be inequitable to allocate any liability for past response costs for the Sites to the government under CERCLA § 113(f)(1). Lockheed indirectly recovered through U.S.-

government contracts the lion's share of its past response costs at the Sites, plus a profit. And Lockheed has indirectly recovered through the same U.S.-government contracts almost all of its extraordinarily high attorneys' fees and costs that it has incurred to sue the government. From this baseline, it would be inequitable for Lockheed to then receive the additional economic benefits – at the taxpayer's expense – of substantial prejudgment interest and windfall profits from fixed-price contracts that would accompany any CERCLA recovery of past response costs. Accordingly, the Court equitably reduces the government's share for past response costs at each of the Sites to 0%.

B. Lockheed's recovery of future response costs would not unfairly burden the taxpayer.

The Court does not come to the same conclusion with regard to future response costs. CERCLA allocation and the DOSA pose no bigger threat of "double recovery" for future costs than for past costs.[97] And it bears emphasis, once more, that the DOSA clearly anticipated (if not intended) the coexistence of Lockheed's indirect recoveries from the government through government contracts and direct recoveries from the government under CERCLA.

Further, most of the equitable considerations that motivated the Court to eliminate any further recovery from the government for past response costs do not apply to *future* response costs. For, pursuant to a declaratory judgment in this case, the government should reimburse Lockheed for its future response as those costs are incurred. Indeed, in nominal terms Lockheed is worse off following a direct CERCLA recovery from the government because it loses profits

[97] Indeed, Lockheed would probably credit any direct payments from the government pursuant to a CERLCA allocation to the DOSA *before* the associated indirect response costs were flowed down to government contracts. Because the CERCLA allocation payment for a given year's response costs would *predate* Lockheed's indirect recovery for those costs through government contracts, the DOSA – and not the CERCLA allocation for future costs – is the source of the government's rub.

that it would otherwise earn if those indirect costs were allocated to contracts (U.S.-government and otherwise) through the DOSA.[98]

Nonetheless, the Court must make a small equitable adjustment to Lockheed's recovery of future response costs at the Sites to account for the – albeit temporary – issue of pre-judgment fixed-price contracts. As described above, fixed-price contracts currently make up over forty percent of Lockheed's contract base, and Lockheed – rather than the government – will benefit from all credits passed on down to pre-judgment fixed-price contracts. (Trial Tr. at 601-04 (Wright); *id.* at 1679-80 (Gatchel).) Further, over ten percent of these contracts will be in existence in five years. (*Id.* at 1680-81 (Gatchel).) However, Lockheed will continue incurring response costs for the Sites far into the future and all post-judgment fixed-price contracts will price in the predictable government CERCLA allocation (and credits) pursuant to this action. With these counterbalancing factors in mind, the Court considers it equitable to decrease modestly the government's equitable allocation for future costs at each facility by 1%.

CONCLUSION

For these foregoing reasons, the Court will allocate a 0% share of liability to the United States for past response costs at the Sites. However, Lockheed is entitled to and will be granted a declaratory judgment that:

1. Twenty-nine percent of its future necessary response costs at or for the Redlands facility that are consistent with the National Contingency Plan will be allocated to the United States and shall be paid by the United States;

[98] Of course, when taken to net present value, an up-front and direct CERCLA payment by the government is likely *more valuable* to Lockheed than the costs recovered and profits earned through government and non-government contracts over five years.

2. Twenty-four percent of its future necessary response costs at or for the Potrero Canyon facility that are consistent with the National Contingency Plan will be allocated to the United States and shall be paid by the United States; and

3. Nineteen percent of its future necessary response costs at or for the LaBorde Canyon facility that are consistent with the National Contingency Plan will be allocated to the United States and shall be paid by the United States.

An Order consistent with this Memorandum Opinion will also be entered on this date.

/s/
ELLEN SEGAL HUVELLE
United States District Judge

Date: April 22, 2014