UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

June 18, 2010

In Reply Refer To: WTR-7

William Pool
Safety, Health & Environmental Affairs Manager
The Boeing Company
5000 East McDowell Road (MC M541-F118)
Mesa, Arizona 85215-9797

Re: September 25, 2009 Clean Water Act Inspection

Dear Mr. Pool:

Enclosed is the June 18, 2010 revised report for our September 25, 2009 inspection of The Boeing Company in Mesa. This report corrects an error in the data and thus replaces the earlier June 11th version. Please submit a short response to the findings in Sections 2 through 5, to EPA, Mesa, and ADEQ, by **July 30, 2010**. The main findings are summarized below:

1 Boeing Rotorcraft Mesa qualifies as a new source metal finisher under 40 CFR 433. The Mesa permit applies Federal standards to just one of two internal outfalls.

2 Boeing Rotorcraft Mesa consistently complied with Federal standards at the main internal outfall, since the Bldg 531 industrial wastewater treatment plant is equivalent in design to the model technology used in originally setting the standards. Moreover, many excellent operational controls are in-place that further improve performance, including batch treatment, iron co-precipitation, testing prior to release, segregation of incompatible wastewaters, satellite collection, and excess holding capacity.

3 A full determination of compliance cannot be made because the internal outfall for the Bldg 583 washrack was not sampled for Federal standards, and there were no sample results or self-certifications for toxic organics at both internal outfalls.

I appreciate your helpfulness extended to me during this inspection. I remain available to the City of Mesa, and to you to assist in any way. Please do not hesitate to call me at (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

Original signed by:

Greg V. Arthur
CWA Compliance Office

Enclosure

cc: Dave Gonzales, Industrial Pretreatment Supervisor, City of Mesa
Gregory Frech, WQ Compliance, ADEQ

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User:	The Boeing Company, Rotorcraft Systems Division 5000 E McDowell Road, Mesa, Arizona 85215-9797 New Source Metal Finishing (40 CFR 433)
Treatment Works:	City of Phoenix 91st Avenue Wastewater Treatment Plant NPDES Permit No. AZ0020524
Pretreatment Program:	City of Mesa
Date of Inspection:	September 25, 2009

Inspection Participants:

US EPA:	Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504
Arizona DEQ:	None
City of Mesa:	Dave Gonzales, Industrial Pretreatment Suprvsr, (480) 644-2484 Dominick Jarnagin, Industrial Pretreatment Inspctr, (480) 644-5299
Boeing:	William Pool, Safety, Health & Envr Affairs Mgr, (480) 891-0727 Jim Witt, Environmental Engineer, (480) 891-0724

Report Prepared By:	Greg V. Arthur, Environmental Engineer June 18, 2010

1.0 Scope and Purpose

On September 25, 2010, EPA and the City of Mesa conducted a compliance evaluation inspection of The Boeing Company, Rotorcraft Systems, in Mesa, Arizona ("Boeing Rotorcraft Mesa"). The purpose was to ensure compliance with the Federal regulations covering the discharge of non-domestic wastewaters into the sewers. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct standards at the correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

Boeing Rotorcraft Mesa is a significant industrial user ("SIU") within the sewer service area administered by the City of Mesa whose compliance was assessed as part of an on-going EPA evaluation of industrial users in EPA Region 9 by sector. The inspection participants are listed on the title page. Arthur conducted the inspection.

See Appendix 1 on page 16 for a schematic of the layout and configuration of wastewater handling, and Appendix 2 on page 17 for a wastewater inventory. Photo documentation of this inspection follows in Section 1.6 on page 6.

1.1 Process Description

Boeing Rotorcraft Mesa operates two aircraft assembly lines, one for rebuilts and repair, and one for new aircraft manufacturing and assembly. Boeing also produces subassemblies for other commercial and military aircraft products. The production-related operations involve parts metal finishing, non-destructive testing, depainting, painting, wash rack cleaning, assembly, disassembly, ultrasonic cleaning, machine shops, flight hangers, and a flight ramp. Support operations include vehicle maintenance, hazardous materials handling, a fuel farm, cooling towers, cooling tower chillers, and deionized water generation. The main production areas are identified below by building number.

- Bldg 520 Main Assembly – media wet blasting, wire harness assembly, aqueous washer

- Bldg 531 Advanced Development Center – assembly, disassembly, painting, surface finish processing (alkaline cleaning, acid desmut, Type I anodizing, tri-acid etching, dichromate seal, passivation), dye penetrant testing, x-ray development, ultrasonic cleaning of composites, machine shop, water-jet cutting, composite mold manufacturing, heat treatment, cooling tower

- Bldg 536 Advanced Development Center – hazardous materials storage

- Bldgs 540/541 Energy Center – cooling towers, utilities, facilities, maintenance

- Bldg 543 Material Center – disassembly, parts repair, warehouse, aqueous degreasing

- Bldg 560 Flight Test Hanger – fire suppression
- Bldg 580 Paint Hanger – dry scrub paint booths, curing, dry sanding, flame spray booth, fire suppression, cooling tower
- Bldg 581 Hazardous Material Storage
- Bldg 583 Paint Strip Facility – x-ray paint strip, parts cooling, outside covered washrack
- Bldg 591 Vehicle Maintenance – outdoor washrack, adjacent fuel tank farm

Boeing Rotorcraft Mesa owns the aircraft and subassemblies manufactured on-site. Construction of the facility as Hughes Helicopters began in 1982. Boeing Rotorcraft Mesa discharges non-domestic wastewaters to the Mesa domestic sewers through a single sewer connection under Mesa permit M-1203-0211. Domestic sewage discharges downstream of the industrial wastewater connection.

1.2 Facility SIC Code

Boeing Rotorcraft Mesa is assigned the SIC codes for the manufacturing and assembly of complete aircraft and the factory rebuilding and repair (SIC 3271), and the manufacturing of aircraft parts and auxiliary equipment (SIC 3728).

1.3 Facility Wastewater Sources

The manufacturing, assembly, repair, and testing operations generate numerous wastewaters from various sources. These wastewaters include spents, rinses, wash down, floor drainage, wash rack drainage, fire suppression water, cooling tower blowdown, mop waters, drainage, and wastewaters from various sources. There is one non-domestic connection to the Mesa sewers that receives combined contributions from an industrial wastewater treatment plant ("IWTP") and all other treated and untreated wastewater sources. The 2006 Mesa permit identifies final outfall 001 as the sewer connection to the domestic sewers, and internal outfall 002 as the compliance sample point following treatment outside the southeast wall of Bldg 531. The Mesa permit does not identify a second internal outfall 003 as the compliance sample point following treatment for the Bldg 583 outdoor wash rack. These compliance sampling points are designated in this report as IWD-1203.01, IWD-1203.02, and IWD-1203.03. ***See*** Photos #1, #2, and #3 in Section 1.7 on page 6.

Spent Solutions – The Bldg 531 surface finishing shop involves numerous metal finishing solutions. The imparted contamination from the processing of parts and the progresssive drop in bath solution strength results in the generation of spents. The generation rates depend on bath usage, effectiveness of bath contamination control, and the amount of drag-out lost into the rinses or to the floor. Some spents from the Bldg 531 surface finishing shop are treated in the IWTP (T1, T4, T6, T8, T11, T18). The chromic-acid Type I anodizing is regenerated strictly through additions, and thus does not generate spents (T14). Losses from

this "adds-only" baths therefore must be through the drag-out of solution into the rinses, since baths without outlets would foul through contamination or fail through use.

Rinses – The Bldg 531 surface finishing shop employs two low-overflow rinses for alkaline cleaning (T2, T3), a spray rinse following anodizing (T14AB), and static rinses following etching, desmut, dichromate sealing, and passsivation (T7, T9, T10, T13, T19). The overflow alkaline rinses bypass batch treatment through the IWTP. The others are drained on a schedule into the IWTP.

Washrack Drainage – The covered outdoor washrack outside of Bldg 583 generates drainage from the jet-washing of aircraft and aircraft parts to a floor drain leading to two pits and a plate-coalescing oil water separator. A second outdoor washrack outside of Bldg 591 generates drainage from the washing of support vehicles and equipment to a floor drain leading to an oil water separator.

Hanger Drainage – The Bldg 560 and 580 hangers each employ automatic fire suppression and have perimeter floor drains leading to pits into the in-plant sewers.

Cooling Tower Bleeds – The contracting firm for cooling tower operations does not use molybdenum-based additives. The additives include caustic, sodium silicate, bleach, sulfuric-acid, hydrogen peroxide, silicon-based polymer defoamer, tri-phosphonium biocide, azole-based alkaline corrosion inhibitor, and sulfonate defoamer.

Residuals – The operations generate oil water separator sludges and skim for off-site reclaim, and spent filtration canisters, and IWTP sludges for off-site disposal as hazardous.

1.4 Facility Process Wastewater Handling

Discharge – Process wastewaters from Boeing Rotorcraft Mesa drain through a single sewer connection into the Mesa domestic sewers. The Mesa permit identifies the sewer connection as the final sample point, designated in this report after the permit number as IWD-1203.01. The Mesa permit also identifies a sample flume outside of Bldg 531 as an internal Federal categorical sample point, designated in this report after the permit number as IWD-1203.02. The permit does not identify the discharge from the Bldg 583 outdoor washrack as a second internal Federal categorical sample point, designed in this report as IWD-1203.03. The permit establishes the peak discharges at IWD-1203.01 and IWD-1203.02 as 330,000 gpd and 22,980 gpd, respectively. Effluent metering of the internal discharge at IWD-1203.02 averaged 1,100 gpd since 2007. ***See*** Photo #1 in Section 1.7 on page 6.

Composition - The process-related wastewaters listed in section 1.3 above would be expected to contain trace levels of copper, chromium, nickel, zinc, oils, fuel, and surfactants, as well as acidity, alkaline conditions, grime and pollutants cleaned off of parts, minerals entrained in the water supply, and the fluorosurfactants, polymers, and glycols from fire suppression test-ing or use. The process-related wastewaters would not be expected to contain molybdenum since only non-molybdenum corrosion inhibitors are used in the cooling towers.

Delivery – All metals processing rinses and spents are hard piped to treatment. Other spents are delivered by tote from the dye penetrant shop, media wet blasting, aqueous parts washing, and aqueous degreasing, to treatment, and then to the sewers. The washracks drain through their oil water separators to the sewers. All other wash waters discharge to floor drains by pipe to the sewers.

Treatment – There are three treatment units on-site, a batch treatment unit for metals bearing flows, and two oil water separators for oily wastewaters. The manufacturing shops notify facility environmental services to change-out spent solutions. Alkaline spents are first tested for delivery either to the IWTP or to off-site disposal as hazardous.

- Bldg 531 IWTP – Batch metals treatment involves three inlet pits, two 2,000 gallon holding tanks, a third 2,000 gallon batch reaction tank, a filter press, a final surge tank, and a 10-micron polishing filter for discharge through internal outfall IWD-1203.02 to the sewers. Boeing Rotorcraft Mesa discharges three to four 1,500 gallon treated batches per week. The batch reaction tank involves chromium reduction, metals precipitation, iron co-precipitation, polymer flocculation, and gravity clarification. The batch reaction tank contents are pre-tested for pH and hexavalent chromium and final tested after each batch for chromium and copper. The metals bearing wastewaters are segregated by treatability. The surface finishing spents and acid-bearing rinses drain to a pit that feeds a dedicated inlet holding tank. Drummed wastewaters also feed into this inlet holding tank. The soap-bearing alkaline rinses drain to second pit for the diversion around treatment through internal outfall IWD-1203.02 to the sewers. All other rinses and the filter press filtrate returns drain to a third pit that feeds a dedicated inlet holding tank. The two inlet holding tanks can alternately feed into the batch treatment.

- Bldg 583 Oil Water Separator – Soapy wash water from the outdoor aircraft jet-cleaning wash rack drains to a central floor drain through two small pits that then feed through a plate coalescing oil water separator. The oil water separator discharges to the sewers through an unpermitted internal sample point designated by EPA as IWD-1203-03.

- Bldg 591 Oil Water Separator – Drainage from a vehicle maintenance wash rack and the shop floor discharge through a standard oil water separator to the sewers.

These three treatment units outlet to the in-plant sewers for combined discharge with all other wastewaters generated on-site through the final compliance sample point IWD-1203-01 to the Mesa sewers. ***See*** Appendix 1 on page 16 of this report for the configuration and lay-out of the wastewater handling on-site. ***Also see*** Sections 3.2 and 3.3 on page 11 of this report, and Photos #1, #2 and #3 in Section 1.7 on page 6.

1.5 Sampling Record

The Mesa permit does not require self-monitoring but Boeing Rotorcraft Mesa does so and reports monthly. The City of Mesa collects its own quarterly sampling on consecutive days for cadmium, chromium, copper, lead, nickel, silver, zinc, and total cyanide at IWD-1203.02. The City of Mesa also samples annually at IWD-1203.01 for these pollutants, as well as for

ammonia, arsenic, aluminum, boron, fluoride, manganese, mercury, molybdenum, selenium, sulfides, suspended solids, dissolved solids, toxic organics and biochemical oxygen demand.

1.6 POTW Legal Authorities

The City of Mesa has enacted an ordinance to implement a pretreatment program within the city limits sewered to Phoenix's 91st Avenue Wastewater Treatment Plant. Under this authority, in Title 8, Chapter 4 of the Mesa City Code, the City issued permit M-1203-0211 for the discharge of non-domestic wastewater from Boeing Rotorcraft Mesa to the sewers.

1.7 Photo Documentation

Three of eight photographs taken during this inspection are depicted below and saved as *boeingmesa-02.jpg, 05.jpg, and 07.jpg*. The other photo files were corrupted and unsavable.

Photo Log
Taken By: Greg V. Arthur
Date: 09/25/09

boeingmesa-01 – Bldg 583 Washrack O/W Sep
boeingmesa-02 – Bldg 583 Washrack
boeingmesa-03 – Bldg 580 Perimeter Trench
boeingmesa-04 – Bldg 531 Surface Finishing Line
boeingmesa-05 – Bldg 531 IWD-1203.02
boeingmesa-06 – Bldg 531 IWTP
boeingmesa-07 – Bldg 531 IWTP Alkaline Bypass
boeingmesa-08 – Final Discharge IWD-1203.01
boeingmesa-09 – Bldg 591 Outdoor Wash Rack

Photo #2: Bldg 531 IWTP Internal Compliance Point
Taken By: Greg V. Arthur
Date: 09/25/09

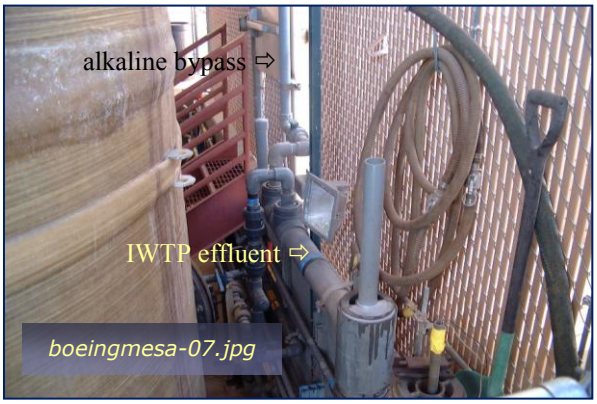


Photo #3: IWTP Effluent Line to In-Plant Sewer
Taken By: Greg V. Arthur
Date: 09/25/09

Photo #1: Bldg 583 Outdoor Covered Wash Rack
Taken By: Greg V. Arthur
Date: 09/25/09

2.0 Sewer Discharge Standards and Limits

Federal categorical pretreatment standards (where they exist), national prohibitions, State groundwater, and the local limits (where they exist) must be applied to the sewered discharges from industrial users. (40 CFR 403.5 and 403.6).

Summary

Boeing Rotorcraft Mesa qualifies for regulation under 40 CFR 433 for new source metal finishing. The Mesa permit correctly applied the local limits and Federal standards. The application of Federal standards, national prohibitions, and local limits was determined through visual inspection. ***See*** Appendix 3 on page 18 of this report for the permit limits.

Requirements

- The Mesa permit must also apply Federal categorical standards at internal outfall IWD-1203.03 to the flows generated by the Bldg 583 washrack cleaning of aircraft.

Recommendations

- It should be determined whether toxic organics management plans could be approved for both internal outfalls, and if so, the Mesa permit should require self-certifications.

- The non-existence should be verified of four operations identified in 2006 permit that were not observed in 2009 inspection. ***See*** Appendix 2 on page 17 of this report.

2.1 Classification by Federal Point Source Category

Boeing Rotorcraft Mesa qualifies as a metal finisher subject to the Federal metal finishing standards for new sources in 40 CFR 433.

New or Existing Sources – In 40 CFR 403.3(k), a metal finishing process constructed after August 31, 1982 is a new source (1) if it entirely replaces a process which caused a discharge from an existing source or (2) if it is substantially independent of the existing sources on-site. The preamble to the 1988 Federal rule states that the new source standards apply when "an existing source undertakes major construction that legitimately provides it with the opportunity to install the best and most efficient production process and wastewater treatment technologies" (*Fed Register, Vol.53, No.200, October 17, 1988, p.40601*). So after the 1982 deadline, the new source standards apply to the new installation of metal finishing lines, rebuilt or moved lines, lines temporarily removed to install secondary containment, or lines converted to do new operations. New source standards generally do not apply to the piecemeal replacement of tanks for maintenance in otherwise intact metal finishing lines.

Hughes Helicopter began manufacturing in 1982, but much of the site was more recently constructed. The Mesa permit establishes that full operations began after the August 31, 1982 rule promulgation deadline. Thus, Boeing Rotorcraft Mesa qualifies as a new source.

2.2 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and their receiving waters from adverse impacts. In particular, they prohibit discharges that can cause the pass-through of pollutants into the receiving waters or into reuse, the operational interference of the sewage treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. The national prohibitions apply nationwide to all non-domestic sewer discharges. The Mesa local limits apply to non-domestic discharges in the Mesa service areas of the Phoenix treatment plant.

2.3 Federal Categorical Pretreatment Standards
New Source Metal Finishing - 40 CFR 433.17

40 CFR 433.17	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	CNa	TTO
daily-maximum (mg/l)	0.11	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
month-average (mg/l)	0.07	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Applicability – Under 40 CFR 433.10(a), the metal finishing standards apply to the process wastewaters from the metal finishing lines because the facility's operations involve electro-plating, electroless plating, anodizing, chemical coating, and etching. The metal finishing standards "... apply to plants that perform ..." the core operations of electroplating, electroless plating, etching, anodizing, chemical coating, or printed circuit board manufacturing and they extend to other on-site operations associated with metal finishing and specifically listed in 40 CFR 433.10(a), such as cleaning, machining, grinding, shearing, heat treating, abrasive jet machining, soldering, flame spraying, electric discharge machining, solvent degreasing, paint stripping, painting, assembly and testing. If any core operation is performed, the standards apply to discharges from all core and associated operations. As a result, the metal finishing standards apply to the process wastewaters listed in Appendix 2 on page 17 of this report.

Basis of the Standards – The new source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, no discharge of cadmium-bearing wastewaters, and if necessary, cyanide destruction and chromium reduction. The best-available-technology standards were set where metal finishers with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

Compliance Deadline – New sources were required to comply on the first day of discharge.

2.4 Combined Federal Standards and Adjustments

The Federal categorical pretreatment standards must be adjusted to account for dilution, if it exists, and for multiple Federal categories, if more than one applies.

Multiple Categories – Not applicable.

Dilution – Under 40 CFR 403.6(d,e), Federal standards must be adjusted using the combined wastestream formula to account for dilution from non-contact cooling waters, water deminer-alizing, boiler blow down, and domestic sewage. The Federal standards apply without adjustment to the internal outfalls IWD-1203.02 and IWD-1203.03 upstream of contributions from the cooling towers. The Federal standards applied to the final outfall IWD-1203.01 would need adjustment for dilution from cooling tower bleeds and domestic sewage.

Cyanide Standards – Under 40 CFR 433.12(c), the Federal cyanide standards apply only to cyanide-bearing flows, with the standards adjusted for dilution from any non-cyanide bearing wastewaters. The cyanide standards apply by default without adjustment at IWD-1203.02 and IWD-1203.03 because there are no identified cyanide sources, although chem-films may contain cyanide. The cyanide standards could apply by default at the final discharge point IWD-1203.01 with adjustment for dilution from cooling tower bleeds and domestic sewage.

Toxic Organics Standards – The Federal standards in 40 CFR 433.12(a,b) allow a facility with an approved toxic organics management plan to certify instead of self-monitor. The Federal rules also allow the permitting authority to sample twice per year in lieu of requiring self-monitoring. Since Mesa samples just one per year, and only at the final discharge point, the Federal standards taken together require Boeing Rotorcraft Mesa to either certify or self-monitor for toxic organics twice per year at the internal outfalls. The toxic organics standards could apply to the final discharge point but that would require adjustment of the standards to account for dilution, something that is inherently difficult to determine for combined domestic/non-domestic sewer laterals. Approved toxics organics management plans, which certifies the non-existence or the physical barrier to discharge over a full or partial list of toxic organics, could shorten or eliminate the list of pollutants to be sampled.

2.5 Federal Prohibitions

The Federal standards in 40 CFR 403.6(d) and 403.17(d) prohibit dilution as a substitute for treatment, and the bypassing of any treatment necessary to comply with standards. The Mesa permit establishes the prohibition against the dilution as a substitute for treatment (Part 8§A-9), and against bypassing treatment necessary to comply (Part 8§B-3).

2.6 Compliance Sampling and Point(s) of Compliance

The permit identifies two compliance sampling points, final outfall IWD-1203.01, and one internal outfall IWD-1203.02, but does not identify the other internal outfall IWD-1203.03.

Federal standards apply end-of-process-after-treatment to all Federally-regulated discharges to the sewers. The final and internal outfalls are all suitable end-of-process-after-treatment sample points representative of the day-to-day discharge of Federally-regulated wastewaters from Boeing Rotorcraft. They are also suitable end-of-process-after-treatment sample points representative of the day-to-day discharge of cyanide-bearing wastewaters as long as there are no cyanide sources. The final outfall is a suitable end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges from Boeing Rotorcraft Mesa.

3.0 Compliance with Federal Categorical Standards

Industrial users must comply with the Federal categorical pretreatment standards that apply to their process wastewater discharges. 40 CFR 403.6(b).

Categorical industrial users must comply with the prohibition against dilution of the Federally-regulated waste streams as a substitute for treatment. 40 CFR 403.6(d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

Boeing Rotorcraft Mesa has consistently complied with Federal standards. There were no violations in the nearly 60 samples collected from internal outfall IWD-1203.02 since 2008. This would be expected since (1) the Bldg 531 industrial wastewater treatment plant is equivalent in design to the model technology used in originally setting the standards, and (2) excellent operational controls are in-place that significantly improve performance.

A full determination of compliance cannot be made because (1) the self-monitoring reports did not include either sample results or self-certifications for toxic organics, and (2) the internal outfall IWD-1203.03 for the Bldg 583 washrack was not sampled for Federal standards. Violations are not expected from the restored sampling as long as the washrack and metal finishing steps do not involve solvents or other toxic organics. ***See*** Section 2.0 on page 7 of this report. ***Also*** see Appendix 3 on page 18 for a summary of the compliance sampling.

Requirements

- None.

Recommendations

- Self-certification statements for both internal outfalls should be submitted with any self-monitoring results at least twice per year.

3.1 Sampling Results

The two-year plus sample record for the internal outfall IWD-1203.02 consists of quarterly multiday sampling collected by Mesa, and monthly self-monitoring collected and reported by Boeing Rotorcraft Mesa, although not required by the permit. All samples for metals were 24-hour composites. The sample record for the internal outfall IWD-1203.02 did not include sample results for toxic organics and the self-monitoring reports did not include certifications to have followed a toxic organics management plan approved by Mesa. Finally, there is no sample record for the internal outfall IWD-1203.03 for the Bldg 583 washrack.

3.2 Best-Available-Technology Treatment
IWD-1203.02 @ Bldg 531 Industrial Wastewater Treatment Plant

All Federally-regulated wastewaters generated by Boeing Rotorcraft Mesa discharge from either the Bldg 531 industrial wastewater treatment plant or the Bldg 583 washrack oil water separator into the in-plant sewers leading to final discharge into the Mesa sewers. The Bldg 531 industrial wastewater treatment plant is designed and operated with technology equivalent to the best-available-technology ("BAT") model treatment. As a result, the sampling results for IWD-1203.02 have demonstrated consistent compliance with the Federal standards, with average and calculated 99th% peak concentrations of 0.012 and 0.064 mg/l cadmium, 0.063 and 0.321 mg/l chromium, 0.014 and 0.105 mg/l copper, <0.005 mg/l lead, 0.008 and 0.041 mg/l nickel, 0.0004 and 0.001 mg/l silver, <0.050 mg/l zinc, and <0.005 mg/l total cyanide. There were no sample results for toxic organics. Overall observed strengths (+) and deficiencies (-) in the design and operation observed during this inspection are listed below.

+ On-site treatment for metals is equivalent in design to the BAT model treatment.
+ Iron co-precipitation improves floc formation, thereby improving metals removal rates.
+ Batch treatment allows testing to ensure compliance prior to release.
+ Pre-testing of the batch reactor contents allows accurate and specialized chemical dosing.
+ Batch treatment has the capacity to handle more than 24-hours of generated wastewaters.
+ Influent equalization adds twice the holding capacity of the batch reactor.
+ Soapy rinses are diverted to discharge, thereby preventing interference with treatment.
+ Excellent segregation effectively separates incompatible wastewaters to off-site disposal.
+ Satellite collection of spents by facility environmental services increases delivery control.

3.3 Best-Available-Technology Treatment
IWD-1203.03 @ Bldg 583 Oil Water Separator

The Bldg 583 washrack oil water separator is not equivalent to the best-available-technology ("BAT") model treatment for metal finishing. However, aircraft washrack drainage would not be expected to entrain levels of metals, cyanide, or toxic organics, requiring treatment, as long as the cleaners themselves do not impart the regulated pollutants. Boeing Rotorcraft Mesa further indicated that the washrack cleaners are limited to alkaline surfactants, and thus do not involve solvents, strong acids, paint strippers, or passivators. Therefore, the washrack drainage would be expected to only entrain oily grime and fluids, some copper, lead, and zinc from parts wear, alkaline surfactants, and fuel. The plate coalescing oil water separator would be expected to effectively remove free (non-emulsified) oils, bound grime, and fuel. There are no sampling results for IWD-1203.03 to demonstrate consistent compliance with the Federal standards. Nevertheless, the weak wastewater strength and the in-place treatment would be expected to result in compliance. Observed strengths (+) and deficiencies (-) in the design and operation observed during this inspection are listed below.

+ Washrack cleaners are limited to alkaline surfactants.
+ Drainage likely entrains only alkaline surfactants and oily grime which means BAT model treatment likely would not be necessary to achieve consistent compliance.

+ Plate coalescing oil water separation improves free oil removal rates.
+ The covered washrack minimizes rainfall run-off contributions.

3.4 Dilution as a Substitute for Treatment

The Federal standards in 40 CFR 403.6(d) prohibit "dilution as a substitute for treatment" in order to prevent compromising BAT model treatment with dilute waste streams. In particular, this prohibition applies when sample results for a diluted waste stream are below the Federal standards and the apparent compliance is used to justify discharge without treatment. There are two conditions that need to be established in order to make a determination of non-compliance with this prohibition. First, some or all of the Federally-regulated wastewaters must discharge without undergoing BAT model treatment or its equivalent. Second, there must be some form of excess water usage within a Federally-regulated process.

For IWD-1203.02, although some regulated wastewaters are diverted around treatment, there is no evidence of "dilution as a substitute for treatment" since there was no observed excess water usage within the Federally-regulated processes. For IWD-1203.03 there is also no evidence of "dilution as a substitute for treatment" since the weak strength of the washrack drainage make BAT model treatment or its equivalent unnecessary.

3.5 Bypass Provision

The Federal standards in 40 CFR 403.17 prohibit the bypassing of any on-site treatment necessary to comply with standards unless the bypass was unavoidable to prevent the loss of life, injury, or property damage, and there were no feasible alternatives. This provision explicitly prohibits bypasses that are the result of a short-sighted lack of back-up equipment for normal downtimes or preventive maintenance. It also explicitly prohibits bypasses that could be prevented through wastewater retention or the procurement of auxiliary equipment. It specifically allows bypasses that do not result in violations of the standards as long as there is prior notice and approval from the sewerage agency or State.

For IWD-1203.02, the diversion of soapy alkaline rinses around the Bldg 531 treatment does not qualify as "bypassing necessary to comply with standards" because the sample record has demonstrated consistent compliance with Federal standards for metals and cyanide. For IWD-1203.03, there also is no bypassing since all Bldg 531 washrack drainage discharges through the existing treatment.

4.0 Compliance with Local Limits and National Prohibitions

All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

The sample record indicates that Boeing Rotorcraft Mesa consistently complies with its local limits for metals, cyanide, toxic organics, and pH. ***See*** Appendix 3 on page 18 of this report. ***Also*** see Sections 3.0 and 5.0 on pages 10 and 15 of this report.

Requirements

- None.

Recommendations

- None.

4.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

(1) cause operational interference with sewage treatment or sludge disposal,
(2) pass-through sewage treatment into the receiving waters or sludge,
(3) are in any way incompatible with the sewerage works, or
(4) do not improve the opportunities to recycle municipal wastewaters and sludge.

This inspection did not include an evaluation of whether the achievement of the national objectives in 40 CFR 403.2 have been demonstrated by the Phoenix 91st Avenue and 23rd Avenue wastewater treatment plants through consistent compliance with their sludge and discharge limits.

4.2 Local Limits for Oxygen Demanding Pollutants and The National Prohibition Against Interference

High-Strength Organics - The process-related wastewaters discharged to the sewers are not high enough in organics strength to pose a risk of interference, with the organics strength not significantly higher than domestic sewage.

Metals and Cyanide – For the discharge through IWD-1203.01, there were no violations of the local limits for arsenic, cadmium, copper, lead, mercury, selenium, silver, zinc, and

cyanide. There is also no evidence that these discharges resulted in the operational interference of the Phoenix collection systems and wastewater treatment plants.

4.3 Local Limits for Toxic Metals, Cyanide, and Other Pollutants and The National Prohibition Against Pass-Through

Metals and Cyanide – For the discharge through IWD-1203.01, there were no violations of the local limits for arsenic, cadmium, copper, lead, mercury, selenium, silver, zinc, and cyanide. There is no evidence that these discharges resulted in a pass-through of pollutants from the Phoenix wastewater treatment plants to the receiving waters.

Toxic Organics – For the discharge through IWD-1203.01, there were no violations of the local limits for benzene, chloroform, pesticides, and PCBs.

Oil and Grease – There are no local limits for oil and grease.

4.4 Local Limits for pH and Sulfides, and The National Prohibitions Against Safety Hazards and Corrosive Structural Damage

Corrosion - Sewer collection system interferences related to the formation of hydrogen sulfide and the resulting acidic disintegration of the sewers are possible but not expected. The wastewaters discharged to the sewers are not high-strength in biodegradable organics and would not be expected to vary widely in pH.

Flammability - Flammability would not be expected because sampling shows that the discharges to the sewer entrain negligible amounts of volatile organics.

5.0 Compliance with Federal Monitoring Requirements

Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).

Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) and 403.12(h).

Permit Requirements – Boeing Rotorcraft Mesa is not required by the Mesa permit to self-monitor at the final discharge point IWD-1203.01 or at the internal outfalls IWD-1203.02 and IWD-1203.03. Nevertheless, Boeing does self-monitor and report monthly from the Bldg 531 industrial wastewater treatment plant at IWD-1203.02. In lieu of self-monitoring, the City of Mesa collects samples to determine compliance, and does so annually at the final discharge IWD-1203.01, and quarterly on consecutive multiple days at the internal outfall IWD-1203.02. There are no sampling results either obtained through self-monitoring or collected by Mesa for the Bldg 583 washrack internal outfall IWD-1203.03. In addition, there were no sample results in the sample record for toxic organics for either internal outfall and no self-certifications to having followed approved toxic organics management plans.

Sampling Protocols – Over the most recent two year plus period, the sample records for the final outfall IWD-1203.01, and the Bldg 531 internal outfall IWD-1203.02 show that Boeing and the City of Mesa (1) collected all samples from designated compliance sampling points, and (2) correctly obtained 24-hour composites for metals and grabs for the other pollutants. It was not determined in this inspection whether appropriate chain-of-custody procedures were followed.

Representativeness – The sample record for IWD-1203.01 is representative of the overall discharge to the sewers over the sampling day, but not over each six-month reporting period because samples were collected annually. The sample record for IWD-1203.02 is representative of the Federally-regulated internal discharge over both the sampling day and the six-month reporting period. However, the sample record is not representative of all Federally-regulated wastewater discharges without sampling at IWD-1203.03.

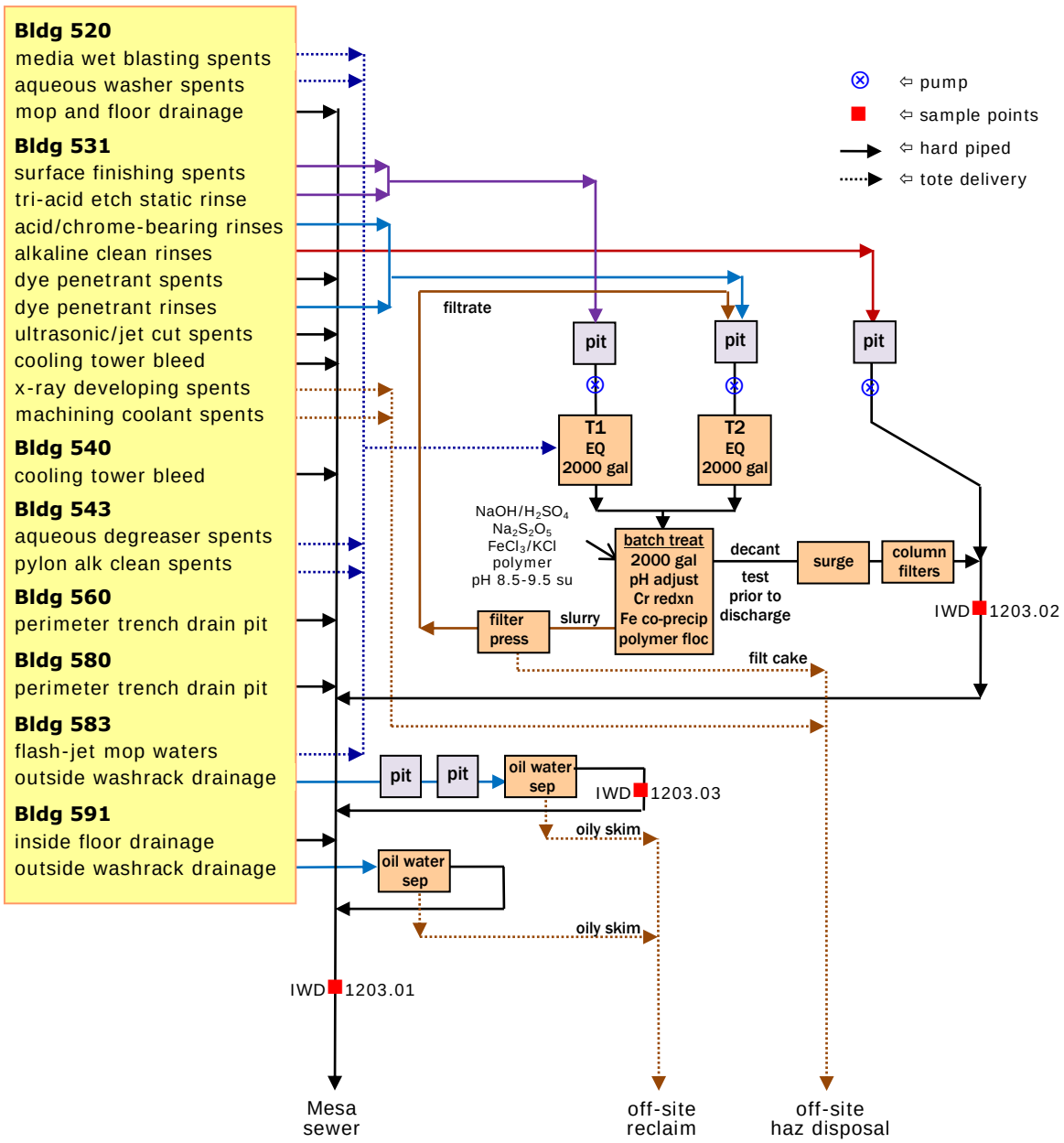
Requirements

- ***See*** Appendix 2 on page 17 of this report for the self-monitoring and city monitoring requirements for that would be considered to be representative of the discharges.

Recommendations

- Self-certification statements should include copies of the hazardous waste manifests documenting the off-hauling of spents, and residuals.

Appendix 1
Boeing Rotorcraft Mesa - Configuration and Layout



Appendix 2
Boeing Rotorcraft Mesa – Wastewater Inventory, Federal Category, and Delivery Method

Delivery of Generated Wastewater		FedCat
Discharge Only @ IWD-1203.01		
FINAL	Bldg 520 wet blast room drainage	unreg
FINAL	Bldg 520 mop drain	unreg
FINAL	Bldg 531 ultrasonic clean spents	433
FINAL	Bldg 531 cooling tower bleed	dilute
FINAL	Bldg 540 cooling tower bleeds	dilute
PIT-1	Bldg 560 perimeter trench drains	unreg
PIT-1	Bldg 580 perimeter trench drains	unreg
OW-1	Bldg 591 wash rack drainage	unreg
OW-1	Bldg 591 inside floor drainage	unreg
No Discharge to the Sewers		
HAZ	Bldg 531 x-ray develop spents	433
HAZ	Bldg 531 machining coolants	433
ADDS	Bldg 531 T14 Type I anodize	433✦
UNK	Bldg 531 brush plating	433✦✧
UNK	Bldg 531 machine shop rinses	433
UNK	Bldg 580 chem film	433✦✧
UNK	Bldg 580 landing gear cleaning	433
BASIN	storm water run-off	dilute

Delivery of Generated Wastewater		FedCat
Discharge @ IWD-1203.02		
DRUM	Bldg 520 wet blast spents	433
DRUM	Bldg 520 aqueous washer spents	433
IWTP	Bldg 531 T1 alk clean spent	433
IWTP	Bldg 531 T2 1°cascade rinse for T1	433
IWTP	Bldg 531 T3 2°cascade rinse for T1	433
IWTP	Bldg 531 T4 alk clean spent	433
IWTP	Bldg 531 T5 1°static rinse for T4	433
IWTP	Bldg 531 T6 tri-acid etch spents	433✦
IWTP	Bldg 531 T7 1°static rinse for T6	433✦
IWTP	Bldg 531 T8 desmut spents	433
IWTP	Bldg 531 T9 1°static rinse for T8	433
IWTP	Bldg 531 T10 2°static rinse for T8	433
IWTP	Bldg 531 T11 dichromate spents	433
IWTP	Bldg 531 T13 static rinse for T11	433
IWTP	Bldg 531 T14AB spray rinse T14	433✦
IWTP	Bldg 531 T18 passivation spents	433✦
IWTP	Bldg 531 T19 static rinse for T18	433✦
DRUM	Bldg 531 dye-pen spents	433
IWTP	Bldg 531 dye-pen rinse	433
IWTP	Bldg 531 water-jet cutting spents	433
DRUM	Bldg 543 aq degrease spents	433
DRUM	Bldg 543 pylon alk clean spents	433
DRUM	Bldg 583 flash-jet mop waters	433
Discharge @ IWD-1203.03		
OW-3	Bldg 583 wash rack jet-soap wash	433

Federal Category Key	
433	Metal Finishing *psns*
unreg	Unregulated
dilute	40 CFR 403.6(e)(1)(i)
✦	chromium-bearing
✧	possible CN-bearing

Delivery and Handling Key	
FINAL	IWD-1203.01 – Sewer line to final discharge point
PIT-1	IWD-1203.01 – Pit to sewer line to final discharge point
OW-1	IWD-1203.01 – Bldg 591 oil water separator to final point
IWTP	IWD-1203.02 – Sewer lines to Bldg 531 IWTP
DRUM	IWD-1203.02 – Collected into drums to Bldg 531 IWTP
OW-3	IWD-1203.03 – Bldg 583 oil water separator to final point
HAZ	Collected to drums for off-site disposal as hazardous
ADDS	Additions only
UNK	Identified in 2006 permit but not observed in 2009 inspection
BASIN	All storm water run-off to drywells and retention basins

Appendix 3
Sewer Discharge Standards and Limits for Boeing Rotorcraft Mesa

Pollutants Of Concern	Fed stds (d-max)	Fed stds (mo-av)	nat'l pro (inst)	local limits (inst/dmax)	monitoring frequency ① discharger	city
Final Outfall @ IWD-1203.01					1203.01	1203.01
arsenic (mg/l)	-	-	-	0.13	③	**2/year**
cadmium (mg/l)	②	②	-	0.047	③	**2/year**
copper (mg/l)	②	②	-	1.5	③	**2/year**
lead (mg/l)	②	②	-	0.41	③	**2/year**
mercury (mg/l)	-	-	-	0.0023	③	**2/year**
selenium (mg/l)	-	-	-	0.10	③	**2/year**
silver (mg/l)	②	②	-	1.2	③	**2/year**
zinc (mg/l)	②	②	-	3.5	③	**2/year**
total cyanide (mg/l)	②	②	-	2.0	③	**2/year**
toxic organics (mg/l) ⑦	②④	-	-	-	③	-
benzene (mg/l) ⑦	-	-	-	0.035	③	**2/year**
chloroform (mg/l) ⑦	-	-	-	2.0	③	**2/year**
pesticides and PCBs ⑦	-	-	-	⑥	③	**2/year**
flow (gpd)	-	-	-	330,000	continuous	-
pH (s.u.)	-	-	<5.0	-	**daily**	-
explosivity	-	-	<140°F ⑤	<10% LEL	③	③

Pollutants Of Concern	Fed stds (d-max)	Fed stds (mo-av)	local limits (inst/dmax)	monitoring frequency ① discharger		city	
Internal Outfalls @ IWD-1203.02 and IWD-1203.03				1203.02	1203.03	1203.02	1203.03
cadmium (mg/l)	0.11	0.07	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
chromium (mg/l)	2.77	1.71	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
copper (mg/l)	3.38	2.07	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
lead (mg/l)	0.69	0.43	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
nickel (mg/l)	3.98	2.38	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
silver (mg/l)	0.43	0.24	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
zinc (mg/l)	2.61	1.48	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
total cyanide (mg/l)	1.20	0.65	-	**1/six-mos**	**1/six-mos**	4/quarter	**1/year**
toxic organics (mg/l) ⑦	2.13	-	-	**1/six-mos**	**1/six-mos**	④	④
pH (s.u.)	-	-	5.0-10.5 ⑧	each batch	**1/six-mos**	-	-
flow (gpd)	-	-	22,980 ⑧	each batch	**1/six-mos**	-	-

① Recommended **reductions in green**. Recommended **increases in red**.
② Federal standards apply can also apply at IWD-1203.01 with an adjustment to account for dilution.
③ As part of periodic priority pollutant scans in order to identify changes in discharge quality.
④ Self-certification to following an approved toxic organics management plan is allowed in lieu of self-monitoring. A City inspection could then qualify as an independent determination.
⑤ Closed-cup flashpoint.
⑥ The Mesa permit (Part 6§J) prohibits the introduction of these pollutants in any amount.
⑦ Total toxic organics defined as the concentration sum for all pollutants listed in 40 CFR 433.11(e).
⑧ Applied in current permit only to IWD-1203.02.

Appendix 4
Wastewater Discharge Quality for Boeing Rotorcraft Mesa

IWD-1203.01 Sample Record (01/01/08-12/31/09)

pollutants (µg/l) ①	02/04/09	01/24/08	pollutants (µg/l) ①	02/04/09	01/24/08
aluminum	380	670	nickel	<10	8.2
arsenic	<10	2.2	selenium	<25	5.5
boron	640	590	silver	<5	<10
cadmium	<3	4.4	zinc	260	360
chromium	<10	31	volatile organics (624)	4.1	14.7
copper	100	69	semi-volatile oragnics (625)	<40	<40
total cyanide	-	<20	ammonium (mg/l)	4	-
fluoride	900	790	chem oxygen demand (mg/l)	810	920
lead	<10	2.7	biochem oxy demand (mg/l)	440	-
manganese	55	67	total suspended solids (mg/l)	380	370
mercury	<0.2	<0.2	total dissolved solids (mg/l)	1300	960
molybdenum	11	11	sulfides (mg/l)	0.40	0.48

IWD-1203.02 Sample Record Summary (01/01/08-03/31/10)

pollutants (µg/l)	effluent sampling results				violation rate ②			sample
	mean	99th%	min	max	d-max	mo-av	instant	count
aluminum	<100	<100	<100	<100	-	-	-	5
cadmium	12.2	64.1	<1	110	0/57	0/24	-	57
chromium	63.1	320.7	6.4	450	0/57	0/24	-	57
copper	14.3	105.4	<5	200	0/57	0/24	-	57
total cyanide	<5.0	<5.0	<5.0	<5.0	0/7	0/7	-	7
lead	<5	<5	<1	<50	0/57	0/24	-	57
molybdenum	21.6	68.0	<10	50	-	-	-	5
nickel	7.5	40.5	<5	95	0/57	0/24	-	57
silver	0.4	1.4	<1	2.5	0/56	0/24	-	56
zinc	<50	<50	<50	55	0/57	0/24	-	57
flow (gpd)	1094	1644	500	1600	-	-	0/26	26
pH (s.u.)	6.9 min – 7.9 median – 9.1 max				-	-	0/26	26

① No violations of Mesa local limits for these annual samples collected at IWD-1203.01.
② Monthly averages calculated by calendar month of both self-monitoring and Mesa sampling.