

James Fischer, P.E.

Areas of Testimony

1. Permit Compliance and Expectations
2. Culpability Factor
3. District Declarations
4. Example SSO reduction practices

THANK YOU STEVE. GOOD MORNING BOARD MEMBERS, CHAIR AND ADVISORY TEAM MEMBERS.

MY NAME IS **JAMES FISCHER**, WATER RESOURCES CONTROL ENGINEER WITH THE STATE BOARD'S OFFICE OF ENFORCEMENT. I AM A LICENSED PROFESSIONAL ENGINEER AND I HAVE TAKEN THE OATH.

MY TESTIMONY WILL COVER THE FOLLOWING FOUR AREAS.

FIRST, I WILL PROVIDE SOME INFORMATION TO ASSIST WITH FAMILIARITY OF THE SANITARY SEWER SYSTEMS WASTE DISCHARGE REQUIREMENTS AND REVIEW GENERAL PERMIT COMPLIANCE EXPECTATIONS FOR DETERMINING THE CULPABILITY, ONE OF SEVERAL ELEMENTS THAT DETERMINE THE OVERALL PENALTY YOU WILL HEAR MORE ABOUT IN HOPE'S UPCOMING PRESENTATION,

SECOND, I WILL REVIEW THE CULPABILITY FACTOR AND DISCUSS DETAILS OF THE INFORMATION WE CONSIDERED, BOTH THE PROS AND CONS THAT EITHER INCREASE THE CULPABILITY OR DECREASE THE CULPABILITY SCORE WHICH EITHER INCREASES OR DECREASES THE OVERALL RESULTING PENALTY,

THIRD, I WILL PROVIDE A FEW COMMENTS ON THE DISTRICT'S DECLARATIONS, AND

LAST, I WILL PRESENT A FEW "PROACTIVE" SSO REDUCTION APPROACHES RELEVANT TO THE DISCHARGES BEING DISCUSSED TODAY.

I WILL FIRST BRIEFLY TELL YOU ABOUT MY EXPERIENCE AND PROFESSIONAL EXPERTISE.

- I'VE WORKED IN STATE SERVICE AS A REGULATORY ENGINEER FOR OVER 26 YEARS. MY "APPLIED" COMPLIANCE EXPERTISE WITH SEWERS OVER THE PAST 7 YEARS HAS HELPED POSITION ME AS THE STATEWIDE LEAD TO ASSIST REGIONAL BOARDS WITH ENFORCING THIS PERMIT.
- I FORMERLY MANAGED THE STATEWIDE SSO REDUCTION PROGRAM AND HAVE CONDUCTED WELL OVER 50 INDIVIDUAL SEWER SYSTEM COMPLIANCE INSPECTIONS, COVERING BOTH GOOD AND PROBLEMATIC FACILITIES OF ALL TYPES AND SIZES THROUGHOUT THE STATE. SSO TECHNICAL REPORTS, SEWER SYSTEM MANAGEMENT PLANS, SSMP AUDITS, SEWER MASTER PLANS, ARE SOME OF THE CORE DOCUMENTS REVIEWED INCLUDING STRATEGIES, PRACTICES, AND EMERGING TECHNOLOGIES TO ELIMINATE OR REDUCE SSOS.
- I ALSO ASSIST THE WATER BOARDS' WITH ITS ONGOING COMPLIANCE EFFORTS, CONDUCTING PERIODIC PUBLIC SPEAKING ENGAGEMENTS TO HELP COMMUNICATE COMPLIANCE FINDINGS TO THE REGULATED COMMUNITY TO HELP THEM ANTICIPATE, IDENTIFY, AND CORRECTION VIOLATIONS" AS STATED ON PAGE 1 OF OUR ENFORCEMENT POLICY. THIS INCLUDES NETWORKING WITH SEWER EXPERTS, LIKE THE ONES WILL HEAR FROM LATER TODAY, TO CONTINUOUSLY LEARN AND IMPROVE OUR "IN HOUSE" SSO REDUCTION EXPERTISE, IMPROVE PROGRAM CREDIBILITY, AND CONTINUOUSLY BUILD-UP OUR "REAL WORLD" KNOWLEDGE OF EFFECTIVE APPROACHES FOR EFFECTIVE SEWER SYSTEM MANAGEMENT.

Permit Compliance and Expectations

- Sewer System Management Plans (SSMPs), redundancy, and “best practices” employed must:
 - 1) ensure compliance with SSS WDRs, and
 - 2) effectively eliminate or reduce SSOs.
- Culpability analysis considerations:
 - **Permit prohibits discharges** Prohibition C.1
 - “Proactive” system approach Finding 2
 - “Risk management/costs” Finding 5
 - “Alternatives to Discharge” Provision D.6(iii)
 - “Use of adequate backup equipment” Provision D.6(iii)

I WOULD LIKE TO POINT-OUT THAT THE WATER BOARDS DO NOT DICTATE MANNER AND METHOD OF COMPLIANCE.

WE DO, HOWEVER, REQUIRE ALL PERMITTEES TO COMPLY WITH THEIR PERMITS, WHICH MEANS THAT DISCHARGES MUST BE PREVENTED. WE EXPECT WHATEVER PRACTICES SELECTED BY A PERMITTEE TO BE EFFECTIVE IN ELIMINATING OR REDUCING SSOS TO COMPLY WITH THE PERMIT REQUIREMENTS.

- IN ANALYZING COSTA MESA’S BEHAVIOR, INCLUDING ITS POSITIVE AND NEGATIVE FACTORS, THE FOLLOWING PERMIT REQUIREMENTS WERE WEIGHED. THIS GIVES THE DISTRICT CREDIT FOR THE PROACTIVE MEASURES IT TOOK BOTH BEFORE AND AFTER THE SSOS AND ALSO CONSIDERS THE NEGATIVE FACTORS WHERE THEY FELL SHORT.
- THE PERMIT REQUIRES NO DISCHARGES, A “PROACTIVE” APPROACH TO SYSTEM MANAGEMENT WHICH WAS NOT IMPLEMENTED, AND ALSO CONSIDER BOTH RISKS AND COST EFFECTIVENESS TO ELIMINATE OR REDUCE SSOS. I WILL PROVIDE ADDITIONAL INFORMATION ON WHAT THE DISTRICT DID AND DIDN’T DO IN THE NEXT SLIDES.
- ANOTHER COMPONENT WE CONSIDER IN DETERMINING CULPABILITY IS CONSIDERATIONS ALTERNATIVES TO THE DISCHARGE WHICH WAS DEFICIENT IN THIS CASE AND I WILL DESCRIBE MORE ABOUT THIS IN A MOMENT. LET’S NOW TAKE A CLOSER LOOK AT THE DETAILS FOR WHAT WE CONSIDERED FOR ARRIVING AT OUR CULPABILITY SCORE.

District Culpability: Irvine Lift Station SSO

PROACTIVE Measures (before SSO)

1. Identified power failure issues
2. Executed emergency standby generator project (\$323K)
3. Upgraded SCADA system
4. Installed emergency storage basin at station
5. Installed backup “hard-wired” alarm to PLC ultrasonic system
6. Weekly inspections/quarterly review meetings



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THE ACTIONS ON THIS SLIDE INDICATE STEPS THAT COSTA MESA TOOK PRIOR TO THE IRVINE LIFT STATION DISCHARGE THAT WERE PROACTIVE AND POSITIVE, AND HELPED REDUCE ITS CULPABILITY SCORE. THESE ARE POSITIVE THINGS, AND EXPECTED UNDER ITS PERMIT.

WE APPLAUD THESE ACTIONS. COSTA MESA RECOGNIZED THERE WERE POWER FAILURE ISSUES. COSTA MESA UPGRADED ITS SCADA SYSTEM, AND INSTALLED A BACKUP ALARM AND CONDUCTED FREQUENT INSPECTIONS. THEY IDENTIFIED THE NEED FOR AN EMERGENCY STANDBY GENERATOR. THESE ARE ALL GOOD THINGS.

District Culpability: Irvine Lift Station SSO

OTHER ISSUES

1. \$700K underground sewage storage vault full of sewage and storage capacity unavailable during SSO
2. Failed to ensure timely start-up of backup generator deployed
3. Failed to ensure staff properly trained for bypassing failed UPS unit



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HOWEVER, THERE WERE SOME PROBLEMS WITH COSTA MESA'S MANAGEMENT.

COSTA MESA SPENT SIGNIFICANT FUNDS ON A STORAGE VAULT THAT WAS NOT AVAILABLE DURING THIS SSO. IN ADDITION, THERE WERE ALSO DELAYS IN RESPONDING TO THE IRVINE LIFT STATION DISCHARGE AND MITIGATING THE VOLUME DISCHARGED, BOTH BY NOT HAVING A WORKING GENERATOR WHEN THE SPILL OCCURRED, AND NOT HAVING STAFF TRAINED TO IMMEDIATELY RESTART THE STATION, WHICH FURTHER INCREASED THE VOLUME DISCHARGED.

District Culpability: Irvine Lift Station SSO

REACTIVE Measures (after SSO)

1. Upgraded Primary Logic Controller (PLC) panel and installed an alarm on the UPS
2. Re-connected SCADA to a different breaker
3. Installed sensor to monitor wet well levels and alarm high levels so operators can respond before SSO



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THEN, IN ADDITION TO THE GENERAL ISSUES, COSTA MESA TOOK REACTIVE ACTIONS AFTER THE SSO THAT SHOULD HAVE BEEN TAKEN PRIOR TO THIS SSO.


IT UPGRADED ITS PRIMARY LOGIC CONTROLLER PANEL, WHICH EASILY COULD HAVE BEEN DONE PRIOR TO THE EVENT. IT RE-CONNECTED THE SCADA SYSTEM SO THAT THE ALARM WOULDN'T BE VULNERABLE TO A FAILURE THAT OCCURRED HERE AND CAUSED THIS SSO. IT INSTALLED A SENSOR TO MONITOR WET WELL LEVELS AND ALARM HIGH LEVELS SO OPERATORS CAN RESPOND MORE QUICKLY.

ALL OF THIS WAS DONE BASED ON SYSTEM VULNERABILITIES SUCH AS THE POWER ISSUES STEVE MENTIONED EARLIER AT THIS LOCATION. HOWEVER, THIS WAS DONE ONLY AFTER THE WATER QUALITY IMPACTS HAD ALREADY OCCURRED.

District Culpability: Indus Line SSO

PROACTIVE Measures

1. Utilized closed-circuit television (CCTV) to identify “sags” in the sewer lines in 2007
2. Increased cleaning frequency based on known issues



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TRANSITIONING TO THE SECOND DISCHARGE, INVOLVING THE INDUS LINE.....

THIS SPILL INVOLVED A SEWER LINE THAT HAD HAD PREVIOUSLY BEEN PROBLEMATIC AND IDENTIFIED AS HIGH RISK VIA A 2007 VIDEO, SHOWING A “SAGGING” LINE AND TREE ROOT INTRUSION. AS WITH THE IRVINE LIFT STATION SSO, THE PROSECUTION TEAM CONSIDERED THE PROACTIVE MEASURES OF COSTA MESA’S CULPABILITY, BEFORE THE INDUS LINE SSO OCCURRED:

FOR EXAMPLE, THE DISTRICT UTILIZED CCTV TO IDENTIFY SAGS IN ITS SEWER LINES AND INCREASED THE CLEANING FREQUENCY BASED ON KNOWN ISSUES.

District Culpability: Indus Sewage Line SSO

REACTIVE Measures

1. Delayed capital upgrades until 7 years after “sags” were initially identified
2. Installed monitoring system on sewage line (“Smart Cover”)



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HOWEVER, COSTA MESA'S FAILURE TO ADDRESS THE FUNDAMENTAL INFRASTRUCTURE ISSUES GREATLY AFFECTED ITS CULPABILITY SCORE.

COSTA MESA SHOULD HAVE ADDRESSED THE “SAG” WITH UPGRADES THAT WENT BEYOND INCREASED CLEANING. HOWEVER, IT WAS ONLY AFTER THE DISCHARGE THAT COSTA MESA BUDGETED A CAPITAL IMPROVEMENT PROJECT TO REPAIR THIS SEWER LINE. THE DISTRICT ALSO INSTALLED A “SMART COVER” ON THIS LINE TO MORE CLOSELY MONITORS ITS LEVELS OF SEWAGE, TOO LATE, AFTER THE WATER QUALITY IMPACTS ALREADY OCCURRED.

THESE WERE BOTH REACTIVE ACTIONS THE DISTRICT TOOK THAT SHOULD HAVE BEEN TAKEN PRIOR TO THE SSOS.

District Declarations

SCOTT CARROLL, General Manager:

- Mentions District recognition, awards, and proactive programs
- Confirms ~4 year delays in completing generator projects
- Confirms delays in “budgeting” funds (\$353K) to fix Indus Line

Comments:

- “Proactive” approach **necessary and expected** to comply/reduce SSOs
- Ongoing SSO risks/threats and delays should have been identified/mitigated
- Available “best practices” could have eliminated or reduced both SSOs until expensive capital investments realized

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I WILL NEXT PRESENT A FEW COMMENTS ON THE DISTRICT'S DECLARATIONS.

FIRST, SCOTT CARROLL, GENERAL MANAGER MENTIONS COSTA MESA'S AWARDS AND RECOGNITION, AND ALSO DISCUSSES DELAYS IN COMPLETING THE GENERATOR PROJECTS AND BUDGETING DELAYS TO ADDRESS THE INDUS LINE.

THE PERMITS EXPECT COMPLIANCE AND THE DISTRICT TO PROHIBIT DISCHARGES. WE THEREFORE EXPECT THE PROACTIVE STEPS NOTED ON THE PREVIOUS SLIDES, ALTHOUGH WE DID TAKE THEM INTO CONSIDERATION IN CONSIDERING THE DISTRICT'S CULPABILITY.

IN EVALUATING CULPABILITY, WE LOOKED AT WHAT MORE SHOULD HAVE BEEN DONE BASED ON COSTA MESA'S KNOWN WEAKNESSES AND PRIOR PERFORMANCE AT THESE SPECIFIC LOCATIONS. FURTHERMORE, AVAILABLE BEST PRACTICES COULD BEEN PUT IN PLACE UNTIL CAPITAL PROJECTS WERE COMPLETE OR ABLE TO BE FUNDED.

District Declarations

ROB HAMMERS, District Engineer:

- Mentions proactive and costly upgrades to Irvine Lift Station (\$2M upgrades with \$700K spent for underground emergency storage basin)
- Mentions “comprehensive maintenance protocols”

Comments:

- District’s claimed “comprehensive maintenance protocols” fell short of expectations at Irvine List Station SSO since expensive underground emergency sewage vault not available/full of sewage

MR. HAMMERS, COSTA MESA'S LONG TIME DISTRICT ENGINEER, MENTIONS COSTLY UPGRADES AND MAINTENANCE PROTOCOLS.

HOWEVER, WE WOULD NOTE THAT THOSE PROTOCOLS FELL SHORT OF EXPECTATIONS.

THE UNDERGROUND VAULT WAS NOT AVAILABLE ON THE DAY OF THE IRVINE SEWAGE LIFT STATION SSO AND THE PROTOCOLS, IN TERMS OF ADDITIONAL MAINTENANCE TO CLEAN THE INDUS SEWER LINE, WOULD NEVER ADDRESS THE SAGGING LINE THAT NEEDED TO BE REPAIRED.

REGARDLESS OF HOW MUCH THE DISTRICT SPENT ON CLEANING, THE CLEANING WOULD NEVER BE A COMPLETE SUBSTITUTE FOR THE MIS-ALIGNMENT ISSUES THAT WOULD REDUCE THE THREAT OF AN SSO.

District Declarations

ZEKI KAYIRAN, Industry Expert/Contract Engineer

- Confirms District intention of installing dedicated emergency backup generator at the site
- States Irvine Lift Station has redundant equipment

Comments:

- Fails to expand on “best practices” to have SCADA on a separate breaker
- No discussion about “best practices” to ensure staff are trained and competent for responding to SSOs

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FINALLY, FOR ZEKI KAYIRAN, THE DISTRICT'S INDUSTRY EXPERT, HE CONFIRMS COSTA MESA'S PROJECT TO INSTALL A DEDICATED EMERGENCY BACKUP GENERATOR FOR THE IRVINE LIFT STATION AND PROVIDES DETAILS ABOUT THE TYPE OF EQUIPMENT AND REDUNDANCIES INSTALLED AT THE STATION, BUT WHICH DIDN'T PERFORM AS EXPECTED ON THE DAY OF THE DISCHARGE.

HOWEVER, HIS DECLARATION FAILS TO EXPAND ON “BEST PRACTICES” SUCH AS MOVING SCADA CONTROLS TO A SEPARATE CIRCUIT BREAKER WHICH COSTA MESA DID AFTER THE SSO. FURTHER, THE DECLARATION FAILS TO DISCUSS “BEST PRACTICES” FOR ENSURING COLLECTIONS STAFF ARE TRAINED AND COMPETENT FOR TIMELY SSO MITIGATION WHICH WAS A FACTOR IN INCREASING ITS CULPABILITY FOR THE IRVINE SSO I PRESENTED ABOUT EARLIER.

Example SSO “Best Practices”

- Industry Standard Practices are generally accepted set of methods or practices within an industry
- Adequate backup systems are “Industry standard practice” to reduce SSOs risks and threats
- Commonly seen during inspections

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I WOULD LIKE TO NOW TALK ABOUT INDUSTRY STANDARD PRACTICES AND PROVIDE YOU WITH A FEW EXAMPLES.

ADEQUATE BACKUP SYSTEMS INCLUDING INSTALLATION OF REDUNDANT EQUIPMENT SUCH AS MULTIPLE ALARMS ARE TYPICAL “INDUSTRY STANDARD PRACTICES” TO AVOID OR REDUCE SSOS. FOR EXAMPLE, THE IRVINE SEWAGE LIFT STATION HAD BUILT-IN REDUNDANT HIGH LEVEL MONITORS WHICH, UNFORTUNATELY, WERE TIED TO THE SAME CIRCUIT THAT TRIPPED WHEN THEIR POWER SUPPLY FAILED.

WHEN WE EVALUATE CULPABILITY, WE ARE NOT LIMITED TO AN ANALYSIS OF PERFORMANCE STANDARDS OR EVEN INDUSTRY STANDARD PRACTICES. HOWEVER, WE WILL PRESENT SOME INSIGHTS WE’VE SEEN DURING INSPECTIONS ON THE NEXT FEW SLIDES AS EXAMPLES OF WHAT OTHER DISCHARGERS HAVE DONE TO AVOID SSOS. WE USED THIS INFORMATION TO ADJUST THE CULPABILITY SCORE, SLIGHTLY UP IN THE CASE TO A 1.1. HAD THE DISTRICT EMPLOYED SIMILAR MEASURES PRIOR TO THE DISCHARGES, THE SSO MIGHT HAVE BEEN PREVENTED OR LESSENERED, WHICH WOULD HAVE LOWERED THE DISTRICT’S CULPABILITY SCORE FURTHER.

Example SSO Practices

- Portable backup pump and “Smart Cover” installed to supplement SCADA alarms and reduce SSO risks/threats
- Station located adjacent to major street and freeway



THIS SLIDE SHOWS A LARGE PUMP STATION IDENTIFIED BY THIS PARTICULAR CITY AS HIGH RISK AND THREAT FOR AN SSO, SINCE IT IS LOCATED IN A RESIDENTIAL AREA ON A MAJOR STREET ADJACENT TO A FREEWAY.

NOT ONLY DOES STATION HAVE WHAT IRVINE LIFT STATION HAD IN TERMS OF REDUNDANCY (SCADA CONTROLS/ALARMS AND A BACKUP FLOAT SWITCH SYSTEM) THE CITY WENT WELL BEYOND THIS WITH EQUIPPING THE STATION WITH A TEMPORARY PORTABLE PUMP AND AUTOMATIC CONTROLS TO AVOID SSOs. THE WET WELL ALSO HAS A LEVEL SENSOR (SMART COVER) INSTALLED TO PROVIDE ADDITIONAL REDUNDANCY TO THE PRIMARY SYSTEMS MENTIONED ABOVE.

HAD THE DISTRICT APPLIED A SIMILAR APPROACH AT THE IRVINE SEWAGE LIFT STATION BEFORE THE SPILL OCCURRED, THE SSO COULD HAVE BEEN ELIMINATED OR REDUCED.

Example SSO Practices

- “Smart Cover” installed in city mainline to monitor sewage levels in residential area posing high SSO risk/threat
- Assists City with determining appropriate cleaning frequency



THIS SLIDE SHOWS A MANHOLE THIS CITY IDENTIFIED AS A HIGH RISK AND THREAT FOR AN SSO, SINCE IT IS LOCATED IN A RESIDENTIAL AREA.

THIS MANHOLE HAS A LEVEL SENSOR INSTALLED THAT REMOTELY MONITORS THE LEVEL OF THE SEWAGE IN THIS SEWER LINE IN REAL TIME LIKE THE UNIT THAT WAS INSTALLED BY THE DISTRICT BOTH AT IRVINE PUMP STATION AND ON THE INDUS LINE AFTER BOTH SSOS OCCURRED.

THE CITY USES THIS LEVEL SENSOR MONITOR IN TWO WAYS:

- 1) FIRST, IT PROVIDES A TOOL FOR THE CITY TO PRECISELY TIME THE APPROPRIATE CITY CLEANING FREQUENCY FOR THIS SEWER LINE, AND
- 2) SECOND, IT PROVIDES EMERGENCY WARNINGS IF THE HIGH LEVEL SET POINTS ARE REACHED IN THE CASE OF LINE SURCHARGING THAT IMMEDIATELY ALARMS AND ALERTS OPERATORS TO RESPOND TO AVOID AN AVOID SSO AND ANY NEGATIVE IMPACTS.

HAD THE DISTRICT APPLIED A SIMILAR APPROACH ON THE INDUS SEWAGE LINE BEFORE THE SPILL OCCURRED, THE SSO COULD HAVE BEEN ELIMINATED OR REDUCED.

CONCLUSIONS

- SSO reduction best practices are necessary to comply with the SSS WDRs
- District fell short with expected practices which could have eliminated or reduced both SSOs
- Prosecution Team Culpability: 1.1 for both SSOs
- Costa Mesa Culpability: recommends
 - 1.0 for Irvine Lift Station SSO
 - 0.9 for Indus Line SSO

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- WE ARE NOT HERE TO ARGUE WHETHER THE DISTRICT FAILED TO APPLY A SPECIFIC INDUSTRY STANDARD BUT PROVIDE YOU WITH THE WHOLE PICTURE OF BOTH THE POSITIVE AND NEGATIVE INFORMATION WE USED TO ARRIVE AT A SCORE OF 1.1 FOR THE DISTRICT'S CULPABILITY SCORE, WHICH REPRESENTS A SLIGHT INCREASE OVER A NEUTRAL SCORE OF 1.
- HAD COSTA MESA TAKEN ADDITIONAL ACTIONS PRIOR TO THE DISCHARGES OCCURRING, THE SPILLS MIGHT HAVE BEEN PREVENTED OR LESSENERED, AND THE CULPABILITY SCORE WOULD HAVE BEEN LOWER.
- AS YOU HEARD EARLIER FROM STEVE, THE DISTRICT HISTORICALLY HAD PRIOR SSOS IN THESE LOCATIONS THAT SHOULD HAVE ALERTED THE DISTRICT TO VULNERABILITIES IN ITS SYSTEM AND COULD HAVE BEEN USED TO DEVELOP A MORE PROACTIVE APPROACH TO MITIGATE SSO RISKS AND THREATS.
- ON BALANCE, AS WE HAVE POINTED-OUT EARLIER, WE RECOGNIZE THE DISTRICT DID MANY THINGS RIGHT, BUT NEVER LIKE TO HAVE ENFORCEMENT BE THE NEEDED ACTION FOR COURSE CORRECTION. THE DISTRICT FELL SHORT WITH THE EXPECTED PRACTICES AND COMPLIANCE EXPECTATIONS WHICH COULD HAVE ELIMINATED OR REDUCE BOTH SSOS.
- YOU WILL NEXT HEAR FROM HOPE SMYTHE ABOUT THE OTHER ENFORCEMENT POLICY FACTORS BEFORE HEARING FROM COASTKEEPER ABOUT THE DAMAGES THEIR MEMBERS SUFFERED FROM THE SPILLS, AS WELL AS HEARING FROM COSTA MESA ABOUT ITS ARGUMENTS RELATED TO THE ENFORCEMENT POLICY FACTORS.
- THIS CONCLUDES MY TESTIMONY AND I AM HAPPY TO ANSWER ANY QUESTIONS.