Walcoff & Associates

Inter-Office Communications

Date: 9/13/90

TO: Lynette _____

FROM: Christine

DUE DATE: _____

ACCOUNT NO.: _____

☐ **WORD PROCESS** ☐ Draft ☐ Final
☐ **READ &** ☐ Return ☐ File ☐ Toss
☐ **COPY** ☐ Bind ☐ Staple ☐ Clip
____ Copies ☐ Mail ☐ Return ☐ Dist.
☐ **PROOF** ☐ **OTHER:** _____

Est. Time to Complete: _____

Actual Time to Complete: _____

COMMENTS:

Enclosed please find 2 (two) sets of the project plans tasks 702 - 709.

1 - for you
1 - for Ken

Soon you will receive your updated project plans from beginning thru August. If you have any questions. Please let me know.

Christine

EIS
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122
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Resource List - Department of Justice
Site Visits to Seattle and Anchorage

SEATTLE, WASHINGTON

Hotel Accomodations/Meeting Rooms:

- Four Seasons Olympic
  411 University
  (206) 621-1700
  Contact Person: Marie

- Stouffer Madison
  515 Madison Street
  (206) 583-0300
  Contact Person: Jennifer Rinker

- Sheraton Hotel
  1400 Sixth Avenue
  (206) 621-9000
  Contact Person: Eric LeDrew

- Seattle Hilton
  Sixth and University
  (206) 624-0500
  Contact Person: Val Beauchemin

ANCHORAGE, ALASKA

Hotel Accomodations:

- Captain Cook Hotel
  5th and K Street
  (907) 276-6000
  Contact Person: Mark Roetto

- Westmark Hotel
  720 W 5th Avenue
  (907) 276-7676

- Sheraton Anchorage Hotel
  401 East Sixth Avenue
  (907) 276-8700
  Contact Person: Melba

- The Anchorage Hilton
  500 West Third Avenue
  (907) 272-7411

- Anchorage Hotel
  330 E Street
  (907) 272-4553
  Contact Person: Tanya

Corporate Suites/Apartments:

- Corporate Suites - Fontainbleau
  1711 Lore Road
  (907) 344-2812

- Cordova Square
  Eleventh and Cordova
  (907) 274-6143
  Contact Person: Ruth Pease

- Park Plaza Apartments
  201 E. 16th Avenue #101
  (907) 278-3540
  Contact Person: Wolf Klein

Leasing Agent:

- Marston Properties
  Larry Gordon - Assistant Property Manager/Leasing Agent
  4105 Turnagain Blvd.
  (907) 248-1717

Food Service:

- Progressive Catering
  (907) 344-9900
  Sheldon Lencioni/David Newirth

- Scovel's Catering Service
  (907) 277-8306
  Mark Scovell

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 002
Contract No. OC-K-LDN-0047

EIS
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122W

Project No. 702
September
09/11/90

PERCENT COM 0.00%

PROJECT HOURS

		APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	Estimate to Complete	Total urred	Estimated Total	Contract Total	Budget ariance
DIRECT LABOR																		
Project Manager	L. Dennis	10	10	10	10	10	10	10	10	10	10	10	10	120	0.00	120.00	120.00	0.00
Corporate Monit	C. Walcoff	0	4	4	4	4	0	0	0	0	0	0	0	16	0.00	16.00	16.00	0.00
Administrative S	B. Eiler	0	0	4	4	4	4	0	0	0	0	0	0	16	0.00	16.00	16.00	0.00
Contracts Admi	K. Charap	4	4	0	0	0	0	0	0	0	0	0	0	8	0.00	8.00	8.00	0.00
Document Mana	R. Trapan	0	5	5	0	0	0	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
Production Man	L. Frankfu	0	5	5	0	0	0	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
Information Spe	J. Gilliland	0	5	5	5	5	0	0	0	0	0	0	0	20	0.00	20.00	20.00	0.00
Administrative A	CY/KS	10	10	10	10	10	10	0	0	0	0	0	0	60	0.00	60.00	60.00	0.00
Proofreader	AR/	0	5	5	0	0	0	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
Word Processor	R. Wohlfa	0	5	5	0	0	0	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
TOTAL DIRECT LABOR HO		24	53	53	33	33	24	10	10	10	10	10	10	280	0.00	280.00	280.00	0.00

PERCENT COM 0.00%

PROJECT DOLLARS

		APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	Estimate to Complete	Total urred	Estimated Total	Contract Total	Budget ariance
DIRECT LABOR																		
Project Manager	L. Dennis	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$3,174.00	$0.00	$3,174.00	$3,174.00	$0.00
Corporate Monit	C. Walcoff	$0.00	$144.24	$144.24	$144.24	$144.24	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$576.96	$0.00	$576.96	$577.00	($0.04)
Administrative S	B. Eiler	$0.00	$0.00	$101.20	$101.20	$101.20	$101.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$404.80	$0.00	$404.80	$405.00	($0.20)
Contracts Admi	K. Charap	$57.68	$57.68	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$115.36	$0.00	$115.36	$115.00	$0.36
Document Mana	R. Trapan	$0.00	$116.65	$116.65	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$233.30	$0.00	$233.30	$233.00	$0.30
Production Man	L. Frankfu	$0.00	$84.40	$84.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$168.80	$0.00	$168.80	$169.00	($0.20)
Information Spe	J. Gilliland	$0.00	$65.00	$65.00	$65.00	$65.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$260.00	$0.00	$260.00	$260.00	$0.00
Administrative A	CY/KS	$137.90	$137.90	$137.90	$137.90	$137.90	$137.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$827.40	$0.00	$827.40	$827.00	$0.40
Proofreader	AR/	$0.00	$58.55	$58.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$117.10	$0.00	$117.10	$117.00	$0.10
Word Processor	R. Wohlfa	$0.00	$54.10	$54.10	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$108.20	$0.00	$108.20	$108.00	$0.20
TOTAL DIRECT LABOR D		$460.08	$983.02	$1,026.54	$712.84	$712.84	$503.60	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$5,985.92	$0.00	$5,985.92	$5,985.00	$0.92
OVERHEAD	91.18%	$419.50	$896.32	$936.00	$649.97	$649.97	$459.18	$241.17	$241.17	$241.17	$241.17	$241.17	$241.17	$5,457.96	$0.00	$5,457.96	$5,457.00	$0.96
Travel																		
Airfare		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ground Transporation		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Per diem		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL TRAVEL		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OTHER DIRECT COSTS																		
Local Transportation (Staff)		$0.00	$20.00	$20.00	$20.00	$20.00	$20.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
Courier/Delivery		$0.00	$22.00	$14.00	$14.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$50.00	$0.00	$50.00	$50.00	$0.00
Postage		$0.00	$2.00	$2.00	$2.00	$2.00	$2.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$10.00	$0.00	$10.00	$10.00	$0.00
Long Distance Telephone		$0.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$20.00	$0.00	$200.00	$0.00	$200.00	$200.00	$0.00
Reporduction		$0.00	$5.00	$5.00	$5.00	$5.00	$5.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$25.00	$0.00	$25.00	$25.00	$0.00
Materials & Supplies		$0.00	$25.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$25.00	$0.00	$25.00	$25.00	$0.00
EXPERTS		$0.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$10,000.00	$0.00	$10,000.00	$10,000.00	$0.00
TOTAL OTHER DIRECT C		$0.00	$2,594.00	$2,561.00	$2,561.00	$2,547.00	$47.00	$20.00	$20.00	$20.00	$20.00	$20.00	$0.00	$10,410.00	$0.00	$10,410.00	$10,410.00	$0.00
SUBTOTAL COSTS		$879.58	$4,473.34	$4,523.54	$3,923.81	$3,909.81	$1,009.78	$525.67	$525.67	$525.67	$525.67	$525.67	$505.67	$21,853.88	$0.00	$21,853.88	$21,852.00	$1.88
G & A	14.81%	$130.27	$662.50	$669.94	$581.12	$579.04	$149.55	$77.85	$77.85	$77.85	$77.85	$77.85	$74.89	$3,236.56	$0.00	$3,236.56	$3,236.00	$0.56
TOTAL COSTS		$1,009.85	$5,135.84	$5,193.48	$4,504.93	$4,488.85	$1,159.33	$603.52	$603.52	$603.52	$603.52	$603.52	$580.56	$25,090.44	$0.00	$25,090.44	$25,088.00	$2.44
FEE	8.00%	$80.79	$410.87	$415.48	$360.39	$359.11	$92.75	$48.28	$48.28	$48.28	$48.28	$48.28	$46.44	$2,007.23	$0.00	$2,007.23	$2,007.00	$0.23
TOTAL COSTS & FEE		$1,090.64	$5,546.71	$5,608.96	$4,865.32	$4,847.96	$1,252.08	$651.80	$651.80	$651.80	$651.80	$651.80	$627.00	$27,097.67	$0.00	$27,097.67	$27,095.00	$2.67

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 003
Contract No. OC-K-LDN-0047

Project No. 703
September
09/12/90

PERCENT COM 0.00%

PROJECT HOURS

		APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	Estimate to Complete	Total urred	Estimated Total	Contract Total	udge rianc
DIRECT LABOR																		
Project Manag	L. Denni	30	30	40	30	30	20	20	20	20	20	6	6	272	0.00	272.00	272.00	0.0
Corporate Mon	C. Walc	5	10	20	1	1	1	1	1	1	0	0	0	41	0.00	41.00	41.00	0.0
Administrative	B. Eiler	20	10	5	1	1	1	1	1	1	0	0	0	41	0.00	41.00	41.00	0.0
Economic Ass	K. Clata	10	0	10	1	1	1	1	1	1	1	0	0	27	0.00	27.00	27	0.0
Conference M	J. Gale	0	0	27	0	0	0	0	0	0	0	0	0	27	0.00	27.00	27	0.0
Logistics Mana	J. Price	10	0	20	0	20	20	30	30	6	0	0	0	136	0.00	136.00	136	0.0
Contracts Adm	K. Chara	10	10	21	0	0	0	0	0	0	0	0	0	41	0.00	41.00	41.00	0.0
Document Ma	R. Trapa	0	0	5	0	10	10	10	6	0	0	0	0	41	0.00	41.00	41.00	0.0
Senior Writer	S. Sarri	10	10	10	10	10	10	8	0	0	0	0	0	68	0.00	68.00	68	0.0
Junior Writer	J. Simon	20	20	20	20	20	20	16	0	0	0	0	0	136	0.00	136.00	136	0.0
Production Ma	L. Frankf	0	10	10	10	10	10	10	8	0	0	0	0	68	0.00	68.00	68.00	0.0
Information Sp	J. Gillila	0	10	10	10	11	0	0	0	0	0	0	0	41	0.00	41.00	41.00	0.0
Conference Sp	B. Zidek	0	0	15	0	0	10	16	0	0	0	0	0	41	0.00	41.00	41	0.0
Administrative	CY/KS	10	10	18	10	10	10	0	0	0	0	0	0	68	0.00	68.00	68.00	0.0
Date Entry	S. Hulve	0	5	17	5	0	0	0	0	0	0	0	0	27	0.00	27.00	27	0.0
Proofreader	AR/	0	5	17	5	0	0	0	0	0	0	0	0	27	0.00	27.00	27.00	0.0
Word Process	R. Wohlf	0	10	21	10	0	0	0	0	0	0	0	0	41	0.00	41.00	41.00	0.0
TOTAL DIRECT LABOR		125	140	286	113	124	113	113	67	29	21	6	6	1,143	0.00	1,143.00	1,143.00	0.0

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 003
Contract No. OC-K-LDN-0047

Project No. 703
September
09/12/90

PERCENT COM 0.00%

PROJECT DOLLARS

	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	Estimate to Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																	
Project Manag L. Denni	$793.50	$793.50	$1,058.00	$793.50	$793.50	$529.00	$529.00	$529.00	$529.00	$529.00	$158.70	$158.70	$7,194.40	$0.00	$7,194.40	$7,194.00	$0.40
Corporate Mon C. Walc	$180.30	$360.60	$721.20	$36.06	$36.06	$36.06	$36.06	$36.06	$36.06	$0.00	$0.00	$0.00	$1,478.46	$0.00	$1,478.46	$1,471.00	$7.46
Administrative B. Eiler	$506.00	$253.00	$126.50	$25.30	$25.30	$25.30	$25.30	$25.30	$25.30	$0.00	$0.00	$0.00	$1,037.30	$0.00	$1,037.30	$1,032.00	$5.30
Economic Ass K. Clata	$192.30	$0.00	$192.30	$19.23	$19.23	$19.23	$19.23	$19.23	$19.23	$19.23	$0.00	$0.00	$519.21	$0.00	$519.21	$523.00	($3.79)
Conference M J. Gale	$0.00	$0.00	$513.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$513.00	$0.00	$513.00	$517.00	($4.00)
Logistics Mana J. Price	$180.60	$0.00	$361.20	$0.00	$361.20	$361.20	$541.80	$541.80	$108.36	$0.00	$0.00	$0.00	$2,456.16	$0.00	$2,456.16	$2,456.00	$0.16
Contracts Adm K. Chara	$144.20	$144.20	$302.82	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$591.22	$0.00	$591.22	$588.00	$3.22
Document Ma R. Trapa	$0.00	$0.00	$116.65	$0.00	$233.30	$233.30	$233.30	$139.98	$0.00	$0.00	$0.00	$0.00	$956.53	$0.00	$956.53	$952.00	$4.53
Senior Writer S. Sarri	$267.50	$267.50	$267.50	$267.50	$267.50	$267.50	$214.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,819.00	$0.00	$1,819.00	$1,819.00	$0.00
Junior Writer J. Simon	$261.00	$261.00	$261.00	$261.00	$261.00	$261.00	$208.80	$0.00	$0.00	$0.00	$0.00	$0.00	$1,774.80	$0.00	$1,774.80	$1,775.00	($0.20)
Production Ma L. Frankf	$0.00	$168.80	$168.80	$168.80	$168.80	$168.80	$168.80	$135.04	$0.00	$0.00	$0.00	$0.00	$1,147.84	$0.00	$1,147.84	$1,148.00	($0.16)
Information Sp J. Gillila	$0.00	$130.00	$130.00	$130.00	$143.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$533.00	$0.00	$533.00	$530.00	$3.00
Conference Sp B. Zidek	$0.00	$0.00	$191.10	$0.00	$0.00	$127.40	$203.84	$0.00	$0.00	$0.00	$0.00	$0.00	$522.34	$0.00	$522.34	$520.00	$2.34
Administrative CY/KS	$137.90	$137.90	$248.22	$137.90	$137.90	$137.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$937.72	$0.00	$937.72	$938.00	($0.28)
Date Entry S. Hulve	$0.00	$50.50	$171.70	$50.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$272.70	$0.00	$272.70	$275.00	($2.30)
Proofreader AR/	$0.00	$58.55	$199.07	$58.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$316.17	$0.00	$316.17	$319.00	($2.83)
Word Process R. Wohlf	$0.00	$108.20	$227.22	$108.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$443.62	$0.00	$443.62	$441.00	$2.62
TOTAL DIRECT LABOR	$2,663.30	$2,733.75	$5,256.28	$2,056.54	$2,446.79	$2,166.69	$2,180.13	$1,426.41	$717.95	$548.23	$158.70	$158.70	$22,513.47	$0.00	$22,513.47	$22,498.00	$15.47
OVERHEAD 91.18%	$2,428.40	$2,492.63	$4,792.68	$1,875.15	$2,230.98	$1,975.59	$1,987.84	$1,300.60	$654.63	$499.88	$144.70	$144.70	$20,527.78	$0.00	$20,527.78	$20,514.00	$13.78
Travel																	
Airfare	$700.00	$0.00	$0.00	$0.00	$0.00	$1,400.00	$0.00	$0.00	$0.00	$1,900.00	$0.00	$0.00	$4,000.00	$0.00	$4,000.00	$4,000.00	$0.00
Ground Transporation	$40.00	$0.00	$0.00	$0.00	$0.00	$80.00	$0.00	$0.00	$0.00	$80.00	$0.00	$0.00	$200.00	$0.00	$200.00	$200.00	$0.00
Per diem	$200.00	$0.00	$0.00	$0.00	$0.00	$600.00	$0.00	$0.00	$0.00	$700.00	$0.00	$0.00	$1,500.00	$0.00	$1,500.00	$1,500.00	$0.00
TOTAL TRAVEL	$940.00	$0.00	$0.00	$0.00	$0.00	$2,080.00	$0.00	$0.00	$0.00	$2,680.00	$0.00	$0.00	$5,700.00	$0.00	$5,700.00	$5,700.00	$0.00
OTHER DIRECT COSTS																	
Equipment Purchase (c	$0.00	$0.00	$2,500.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,500.00	$0.00	$3,500.00	$3,500.00	$0.00
Local Transportation (St	$20.00	$20.00	$100.00	$20.00	$20.00	$30.00	$30.00	$30.00	$30.00	$0.00	$0.00	$0.00	$300.00	$0.00	$300.00	$300.00	$0.00
Courier/Delivery	$30.00	$0.00	$100.00	$20.00	$15.00	$15.00	$10.00	$10.00	$0.00	$0.00	$0.00	$0.00	$200.00	$0.00	$200.00	$200.00	$0.00
Postage	$10.00	$10.00	$30.00	$10.00	$10.00	$10.00	$10.00	$10.00	$0.00	$0.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
Long Distance Telephon	$200.00	$100.00	$500.00	$200.00	$100.00	$120.00	$120.00	$120.00	$200.00	$120.00	$20.00	$200.00	$2,000.00	$0.00	$2,000.00	$2,000.00	$0.00
Reporduction	$10.00	$10.00	$20.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$0.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
Materials & Supplies	$0.00	$0.00	$100.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
EXPERTS	$10,000.00	$0.00	$10,000.00	$0.00	$5,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$25,000.00	$0.00	$25,000.00	$25,000.00	$0.00
TOTAL OTHER DIREC	$10,270.00	$140.00	$13,350.00	$1,260.00	$5,155.00	$185.00	$180.00	$180.00	$240.00	$120.00	$20.00	$200.00	$31,300.00	$0.00	$31,300.00	$31,300.00	$0.00
SUBTOTAL COSTS	$16,301.70	$5,366.38	$23,398.96	$5,191.69	$9,832.77	$6,407.28	$4,347.97	$2,907.01	$1,612.58	$3,848.11	$323.40	$503.40	$80,041.25	$0.00	$80,041.25	$80,012.00	$29.25
G & A 14.81%	$2,414.28	$794.76	$3,465.39	$768.89	$1,456.23	$948.92	$643.93	$430.53	$238.82	$569.91	$47.90	$74.55	$11,854.11	$0.00	$11,854.11	$11,850.00	$4.11
TOTAL COSTS	$18,715.98	$6,161.14	$26,864.35	$5,960.58	$11,289.00	$7,356.20	$4,991.90	$3,337.54	$1,851.40	$4,418.02	$371.30	$577.95	$91,895.36	$0.00	$91,895.36	$91,862.00	$33.36
FEE 8.00%	$1,497.28	$492.89	$2,149.15	$476.85	$903.12	$588.50	$399.35	$267.00	$148.11	$353.44	$29.70	$46.24	$7,351.63	$0.00	$7,351.63	$7,349.00	$2.63
TOTAL COSTS & FEE	$20,213.26	$6,654.03	$29,013.50	$6,437.43	$12,192.12	$7,944.70	$5,391.25	$3,604.54	$1,999.51	$4,771.46	$401.00	$624.19	$99,246.99	$0.00	$99,246.99	$99,211.00	$35.99

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 004
Contract No. OC-K-LDN-0047

Project No. 704
September
09/12/90

PERCENT COM 0.00%

PROJECT HOURS

	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																	
Proj L. Denni	70	70	70	60	60	60	60	60	60	10	10	10	600	0.00	600.00	600.00	0.00
Cor C. Walc	20	20	20	20	20	20	20	20	20	20	0	0	200	0.00	200.00	200.00	0.00
Adm B. Eiler	10	10	10	10	10	10	10	10	10	10	0	0	100	0.00	100.00	100.00	0.00
Con J. Gale	0	0	0	20	20	20	20	20	0	0	0	0	100	0.00	100.00	100	0.00
Logi J. Price	0	0	0	40	40	40	40	40	0	0	0	0	200	0.00	200.00	200	0.00
Con K. Chara	10	10	10	10	10	10	10	10	0	0	0	0	80	0.00	80.00	80.00	0.00
Doc R. Trapa	0	0	0	10	10	10	10	10	10	0	0	0	60	0.00	60.00	60.00	0.00
Seni S. Sarri	0	0	0	0	10	10	10	10	0	0	0	0	40	0.00	40.00	40	0.00
Juni J. Simon	0	0	0	0	20	20	20	20	0	0	0	0	80	0.00	80.00	80	0.00
Dat M. Gend	100	100	100	100	100	100	0	0	0	0	0	0	600	0.00	600.00	600	0.00
Pro L. Frankf	0	0	10	10	10	10	10	10	10	10	0	0	80	0.00	80.00	80.00	0.00
Infor J. Gillila	0	100	100	100	100	0	0	0	0	0	0	0	400	0.00	400.00	400.00	0.00
Con B. Zidek	0	0	10	10	10	10	0	0	0	0	0	0	40	0.00	40.00	40	0.00
Adm CY/KS	50	50	50	50	50	50	50	50	0	0	0	0	400	0.00	400.00	400.00	0.00
Dat S. Hulve	0	0	20	20	20	20	20	20	20	20	20	20	200	0.00	200.00	200	0.00
Pro AR/	0	0	0	15	15	15	15	0	0	0	0	0	60	0.00	60.00	60.00	0.00
Wor R. Wohlf	0	0	0	20	20	20	20	0	0	0	0	0	80	0.00	80.00	80.00	0.00
TOTAL DIREC	260	360	400	495	525	425	315	280	130	70	30	30	3,320	0.00	3,320.00	3,320.00	0.00

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 004
Contract No. OC-K-LDN-0047

Project No. 704
September
09/12/90

PERCENT COM 0.00%

PROJECT DOLLARS

	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																	
Proj L. Denni	$1,851.50	$1,851.50	$1,851.50	$1,587.00	$1,587.00	$1,587.00	$1,587.00	$1,587.00	$1,587.00	$264.50	$264.50	$264.50	$15,870.00	$0.00	$15,870.00	$15,870.00	$0.00
Cor C. Walc	$721.20	$721.20	$721.20	$721.20	$721.20	$721.20	$721.20	$721.20	$721.20	$721.20	$0.00	$0.00	$7,212.00	$0.00	$7,212.00	$7,212.00	$0.00
Adm B. Eiler	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$0.00	$0.00	$2,530.00	$0.00	$2,530.00	$2,530.00	$0.00
Con J. Gale	$0.00	$0.00	$0.00	$380.00	$380.00	$380.00	$380.00	$380.00	$0.00	$0.00	$0.00	$0.00	$1,900.00	$0.00	$1,900.00	$1,900.00	$0.00
Logi J. Price	$0.00	$0.00	$0.00	$722.40	$722.40	$722.40	$722.40	$722.40	$0.00	$0.00	$0.00	$0.00	$3,612.00	$0.00	$3,612.00	$3,612.00	$0.00
Con K. Chara	$144.20	$144.20	$144.20	$144.20	$144.20	$144.20	$144.20	$144.20	$0.00	$0.00	$0.00	$0.00	$1,153.60	$0.00	$1,153.60	$1,154.00	($0.40)
Doc R. Trapa	$0.00	$0.00	$0.00	$233.30	$233.30	$233.30	$233.30	$233.30	$233.30	$0.00	$0.00	$0.00	$1,399.80	$0.00	$1,399.80	$1,400.00	($0.20)
Seni S. Sarri	$0.00	$0.00	$0.00	$0.00	$267.50	$267.50	$267.50	$267.50	$0.00	$0.00	$0.00	$0.00	$1,070.00	$0.00	$1,070.00	$1,070.00	$0.00
Juni J. Simon	$0.00	$0.00	$0.00	$0.00	$261.00	$261.00	$261.00	$261.00	$0.00	$0.00	$0.00	$0.00	$1,044.00	$0.00	$1,044.00	$1,044.00	$0.00
Dat M. Gend	$1,683.00	$1,683.00	$1,683.00	$1,683.00	$1,683.00	$1,683.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$10,098.00	$0.00	$10,098.00	$10,098.00	$0.00
Pro L. Frankl	$0.00	$0.00	$168.80	$168.80	$168.80	$168.80	$168.80	$168.80	$168.80	$168.80	$0.00	$0.00	$1,350.40	$0.00	$1,350.40	$1,350.00	$0.40
Infor J. Gillila	$0.00	$1,300.00	$1,300.00	$1,300.00	$1,300.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,200.00	$0.00	$5,200.00	$5,200.00	$0.00
Con B. Zidek	$0.00	$0.00	$127.40	$127.40	$127.40	$127.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$509.60	$0.00	$509.60	$510.00	($0.40)
Adm CY/KS	$689.50	$689.50	$689.50	$689.50	$689.50	$689.50	$689.50	$689.50	$0.00	$0.00	$0.00	$0.00	$5,516.00	$0.00	$5,516.00	$5,516.00	$0.00
Dat S. Hulve	$0.00	$0.00	$202.00	$202.00	$202.00	$202.00	$202.00	$202.00	$202.00	$202.00	$202.00	$202.00	$2,020.00	$0.00	$2,020.00	$2,020.00	$0.00
Pro AR/	$0.00	$0.00	$0.00	$175.65	$175.65	$175.65	$175.65	$0.00	$0.00	$0.00	$0.00	$0.00	$702.60	$0.00	$702.60	$703.00	($0.40)
Wor R. Wohlf	$0.00	$0.00	$0.00	$216.40	$216.40	$216.40	$216.40	$0.00	$0.00	$0.00	$0.00	$0.00	$865.60	$0.00	$865.60	$866.00	($0.40)
TOTAL DIRE	**$5,342.40**	**$6,642.40**	**$7,140.60**	**$8,603.85**	**$9,132.35**	**$7,832.35**	**$6,021.95**	**$5,629.90**	**$3,165.30**	**$1,609.50**	**$466.50**	**$466.50**	**$62,053.60**	**$0.00**	**$62,053.60**	**$62,055.00**	**($1.40)**
OVE 91.18%	**$4,871.20**	**$6,056.54**	**$6,510.80**	**$7,844.99**	**$8,326.88**	**$7,141.54**	**$5,490.81**	**$5,133.34**	**$2,886.12**	**$1,467.54**	**$425.35**	**$425.35**	**$56,580.46**	**$0.00**	**$56,580.46**	**$56,582.00**	**($1.54)**
Travel																	
Airfare	$0.00	$0.00	$0.00	$6,230.00	$6,230.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$12,460.00	$0.00	$12,460.00	$12,461.00	($1.00)
Ground Tran	$0.00	$0.00	$0.00	$340.00	$340.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$680.00	$0.00	$680.00	$680.00	$0.00
Per diem	$0.00	$0.00	$0.00	$3,726.00	$3,726.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7,452.00	$0.00	$7,452.00	$7,453.00	($1.00)
TOTAL TRAV	**$0.00**	**$0.00**	**$0.00**	**$10,296.00**	**$10,296.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$20,592.00**	**$0.00**	**$20,592.00**	**$20,594.00**	**($2.00)**
OTHER DIRECT COSTS																	
Computer Eq	$2,400.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,400.00	$0.00	$2,400.00	$2,400.00	$0.00
Local Transp	$80.00	$83.00	$83.00	$83.00	$83.00	$83.00	$83.00	$83.00	$83.00	$83.00	$83.00	$83.00	$993.00	$0.00	$993.00	$993.00	$0.00
Courier/Deliv	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$45.00	$0.00	$0.00	$495.00	$0.00	$495.00	$495.00	$0.00
Postage	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$300.00	$0.00	$300.00	$300.00	$0.00
Long Distanc	$333.00	$333.00	$333.00	$333.00	$333.00	$333.00	$333.00	$333.00	$333.00	$333.00	$333.00	$337.00	$4,000.00	$0.00	$4,000.00	$4,000.00	$0.00
Reporduction	$31.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$34.00	$405.00	$0.00	$405.00	$405.00	$0.00
Materials & S	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$600.00	$0.00	$600.00	$600.00	$0.00
EXPERTS	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$120,000.00	$0.00	$120,000.00	$120,000.00	$0.00
TOTAL OTHE	**$12,969.00**	**$10,575.00**	**$10,575.00**	**$10,575.00**	**$10,575.00**	**$10,575.00**	**$10,575.00**	**$10,575.00**	**$10,575.00**	**$10,570.00**	**$10,525.00**	**$10,529.00**	**$129,193.00**	**$0.00**	**$129,193.00**	**$129,193.00**	**$0.00**
SUBTOTAL C	**$23,182.60**	**$23,273.94**	**$24,226.40**	**$37,319.84**	**$38,330.23**	**$25,548.89**	**$22,087.76**	**$21,338.24**	**$16,626.42**	**$13,647.04**	**$11,416.85**	**$11,420.85**	**$268,419.06**	**$0.00**	**$268,419.06**	**$268,424.00**	**($4.94)**
G & 14.81%	**$3,433.34**	**$3,446.87**	**$3,587.93**	**$5,527.07**	**$5,676.71**	**$3,783.79**	**$3,271.20**	**$3,160.19**	**$2,462.37**	**$2,021.13**	**$1,690.84**	**$1,691.43**	**$39,752.87**	**$0.00**	**$39,752.87**	**$39,754.00**	**($1.13)**
TOTAL COST	**$26,615.94**	**$26,720.81**	**$27,814.33**	**$42,846.91**	**$44,006.94**	**$29,332.68**	**$25,358.96**	**$24,498.43**	**$19,088.79**	**$15,668.17**	**$13,107.69**	**$13,112.28**	**$308,171.93**	**$0.00**	**$308,171.93**	**$308,178.00**	**($6.07)**
FEE 8.00%	**$2,129.28**	**$2,137.66**	**$2,225.15**	**$3,427.75**	**$3,520.56**	**$2,346.61**	**$2,028.72**	**$1,959.87**	**$1,527.10**	**$1,253.45**	**$1,048.62**	**$1,048.98**	**$24,653.75**	**$0.00**	**$24,653.75**	**$24,654.00**	**($0.25)**
TOTAL COST	**$28,745.22**	**$28,858.47**	**$30,039.48**	**$46,274.66**	**$47,527.50**	**$31,679.29**	**$27,387.68**	**$26,458.30**	**$20,615.89**	**$16,921.62**	**$14,156.31**	**$14,161.26**	**$332,825.68**	**$0.00**	**$332,825.68**	**$332,832.00**	**($6.32)**

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 005
Contract No. OC-K-LDN-0047

Project No. 705

September
09/12/90

PERCENT COM 0.00%

PROJECT HOURS

		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																		
Project Manager	L. Denni	10	10	10	10	10	10	10	10	5	5	5	5	100	0.00	100.00	100.00	0.00
Corporate Monit	C. Walc	2	3	3	3	3	3	3	3	3	3	3	3	35	0.00	35.00	35.00	0.00
Administrative S	B. Eiler	5	5	5	5	5	5	0	0	0	0	0	0	30	0.00	30.00	30.00	0.00
Contracts Admi	K. Chara	5	5	0	0	0	0	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
Document Mana	R. Trapa	0	0	0	0	5	5	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
Junior Writer	J. Simon	0	0	0	0	5	5	0	0	0	0	0	0	10	0.00	10.00	10	0.00
Database Mana	M. Gend	10	10	10	10	10	5	0	0	0	0	0	0	55	0.00	55.00	55	0.00
Production Man	L. Frankf	0	0	0	0	5	5	0	0	0	0	0	0	10	0.00	10.00	10.00	0.00
Information Spe	J. Gillila	10	10	10	10	10	10	5	0	0	0	0	0	65	0.00	65.00	65.00	0.00
Administrative A	CY/KS	10	10	10	10	10	10	10	10	0	0	0	0	80	0.00	80.00	80.00	0.00
Date Entry	S. Hulve	0	0	5	5	5	5	0	0	0	0	0	0	20	0.00	20.00	20	0.00
Proofreader	AR/	0	0	5	5	5	5	0	0	0	0	0	0	20	0.00	20.00	20.00	0.00
Word Processor	R. Wohlf	0	0	5	5	5	5	0	0	0	0	0	0	20	0.00	20.00	20.00	0.00
TOTAL DIRECT LABOR H		52	53	63	63	78	73	28	23	8	8	8	8	465	0.00	465.00	465.00	0.00

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 005
Contract No. OC-K-LDN-0047

Project No. 705
September
09/12/90

PERCENT COM 0.00%

PROJECT DOLLARS		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																		
Project Manager	L. Denni	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$132.25	$132.25	$132.25	$132.25	$2,645.00	$0.00	$2,645.00	$2,645.00	$0.00
Corporate Monit	C. Walc	$72.12	$108.18	$108.18	$108.18	$108.18	$108.18	$108.18	$108.18	$108.18	$108.18	$108.18	$108.18	$1,262.10	$0.00	$1,262.10	$1,262.00	$0.10
Administrative S	B. Eiler	$126.50	$126.50	$126.50	$126.50	$126.50	$126.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$759.00	$0.00	$759.00	$759.00	$0.00
Contracts Admi	K. Chara	$72.10	$72.10	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$144.20	$0.00	$144.20	$144.00	$0.20
Document Mana	R. Trapa	$0.00	$0.00	$0.00	$0.00	$116.65	$116.65	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$233.30	$0.00	$233.30	$233.00	$0.30
Junior Writer	J. Simon	$0.00	$0.00	$0.00	$0.00	$65.25	$65.25	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$130.50	$0.00	$130.50	$131.00	($0.50)
Database Mana	M. Gend	$168.30	$168.30	$168.30	$168.30	$168.30	$84.15	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$925.65	$0.00	$925.65	$926.00	($0.35)
Production Man	L. Frankf	$0.00	$0.00	$0.00	$0.00	$84.40	$84.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$168.80	$0.00	$168.80	$169.00	($0.20)
Information Spe	J. Gillila	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$65.00	$0.00	$0.00	$0.00	$0.00	$0.00	$845.00	$0.00	$845.00	$845.00	$0.00
Administrative A	CY/KS	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$0.00	$0.00	$0.00	$0.00	$1,004.00	$0.00	$1,004.00	$1,004.00	$0.00
Date Entry	S. Hulve	$0.00	$0.00	$50.50	$50.50	$50.50	$50.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$202.00	$0.00	$202.00	$202.00	$0.00
Proofreader	AR/	$0.00	$0.00	$58.55	$58.55	$58.55	$58.55	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$234.20	$0.00	$234.20	$234.00	$0.20
Word Processor	R. Wohlf	$0.00	$0.00	$54.10	$54.10	$54.10	$54.10	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$216.40	$0.00	$216.40	$216.00	$0.40
TOTAL DIRECT LABOR		$959.02	$995.08	$1,086.13	$1,086.13	$1,352.43	$1,268.28	$563.18	$498.18	$240.43	$240.43	$240.43	$240.43	$8,770.15	$0.00	$8,770.15	$8,770.00	$0.15
OVERHEAD	91.18%	$874.43	$907.31	$990.33	$990.33	$1,233.15	$1,156.42	$513.51	$454.24	$219.22	$219.22	$219.22	$219.22	$7,996.60	$0.00	$7,996.60	$7,995.00	$1.60
Travel																		
Airfare		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ground Transporation		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Per diem		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL TRAVEL		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OTHER DIRECT COSTS																		
Computer Equipment		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Local Transportation (Staf		$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$72.00	$0.00	$72.00	$72.00	$0.00
Courier/Delivery		$20.00	$20.00	$0.00	$0.00	$20.00	$20.00	$0.00	$20.00	$0.00	$0.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
Postage		$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
Long Distance Telephone		$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$200.00	$0.00	$0.00	$2,000.00	$0.00	$2,000.00	$2,000.00	$0.00
Reporduction		$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$25.00	$300.00	$0.00	$300.00	$300.00	$0.00
Materials & Supplies		$50.00	$50.00	$50.00	$50.00	$25.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$225.00	$0.00	$225.00	$225.00	$0.00
EXPERTS		$100,000.00	$100,000.00	$100,000.00	$40,066.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$340,066.00	$0.00	$340,066.00	$340,066.00	$0.00
TOTAL OTHER DIRECT		$100,311.00	$100,311.00	$100,291.00	$40,357.00	$286.00	$261.00	$241.00	$261.00	$241.00	$241.00	$31.00	$31.00	$342,863.00	$0.00	$342,863.00	$342,863.00	$0.00
SUBTOTAL COSTS		$102,144.45	$102,213.39	$102,367.46	$42,433.46	$2,871.58	$2,685.70	$1,317.69	$1,213.42	$700.65	$700.65	$490.65	$490.65	$359,629.75	$0.00	$359,629.75	$359,629.00	$0.75
G & A	15.28%	$15,607.67	$15,618.21	$15,641.75	$6,483.83	$438.78	$410.37	$201.34	$185.41	$107.06	$107.06	$74.97	$74.97	$54,951.42	$0.00	$54,951.42	$54,951.00	$0.42
TOTAL COSTS		$117,752.12	$117,831.60	$118,009.21	$48,917.29	$3,310.36	$3,096.07	$1,519.03	$1,398.83	$807.71	$807.71	$565.62	$565.62	$414,581.17	$0.00	$414,581.17	$414,580.00	$1.17
FEE	8.00%	$9,420.17	$9,426.53	$9,440.74	$3,913.38	$264.83	$247.69	$121.52	$111.91	$64.62	$64.62	$45.25	$45.25	$33,166.51	$0.00	$33,166.51	$33,167.00	($0.49)
TOTAL COSTS & FEE		$127,172.29	$127,258.13	$127,449.95	$52,830.67	$3,575.19	$3,343.76	$1,640.55	$1,510.74	$872.33	$872.33	$610.87	$610.87	$447,747.68	$0.00	$447,747.68	$447,747.00	$0.68

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 006
Contract No. OC-K-LDN-0047

Project No. 706
Septembe
09/12/9

PERCENT COM **0.00%**

PROJECT HOURS

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Estimate Complete	Total urred	Estimated Total	Contract Total	udge rianc
DIRECT LABOR																	
WALCOFF SITE:																	
Project L. Denni	10	10	10	10	10	10	10	10	10	10	0	0	100	0.00	100.00	100.00	0.0
Corporat C. Walc	10	10	10	10	10	10	10	10	10	10	0	0	100	0.00	100.00	100.00	0.0
Administ B. Eiler	10	10	10	10	10	10	10	10	10	10	0	0	100	0.00	100.00	100.00	0.0
Confere J. Gale	0	0	10	10	10	10	10	10	10	10	0	0	80	0.00	80.00	80.00	0.0
Scientific S. Sarri	60	40	40	40	40	40	40	40	40	40	40	40	500	0.00	500.00	500.00	0.0
Interagency Coord	0	0	0	0	50	50	50	50	0	0	0	0	200	0.00	200.00	200.00	0.0
Docume R. Trapa	0	0	10	10	10	10	10	10	10	10	10	10	100	0.00	100.00	100.00	0.0
Junior W J. Simon	0	0	0	0	20	20	20	20	20	0	0	0	100	0.00	100.00	100.00	0.0
Systems M. Gend	0	0	0	0	50	50	0	0	0	0	0	0	100	0.00	100.00	100.00	0.0
Producti L. Frankf	0	0	0	50	50	50	50	0	0	0	0	0	200	0.00	200.00	200.00	0.0
Informati J. Gillila	0	40	40	40	40	40	0	0	0	0	0	0	200	0.00	200.00	200.00	0.0
Confere B. Zidek	0	0	20	20	20	20	20	0	0	0	0	0	100	0.00	100.00	100.00	0.0
Administ CY/KS	40	40	40	40	40	0	0	0	0	0	0	0	200	0.00	200.00	200.00	0.0
Data Ent S. Hulve	0	40	40	40	40	40	40	40	40	40	40	0	400	0.00	400.00	400.00	0.0
Proofrea AR/	0	0	20	20	20	20	20	0	0	0	0	0	100	0.00	100.00	100.00	0.0
Word Pr R. Wohlf	0	0	40	40	40	40	40	0	0	0	0	0	200	0.00	200.00	200.00	0.0
GOVERNMENT SITE:																	
Legal Assistant	100	100	100	100	100	0	0	0	0	0	0	0	500	0.00	500.00	500.00	0.0
Office Assistant	100	100	100	100	100	0	0	0	0	0	0	0	500	0.00	500.00	500.00	0.0
OFF SITE:																	
Economic Assess	0	0	0	0	40	40	40	40	40	0	0	0	200	0.00	200.00	200.00	0.0
TOTAL DIRECT LA	330	390	490	540	700	460	370	240	190	130	90	50	3,980	0.00	3,980.00	3,980.00	0.0

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 006
Contract No. OC-K-LDN-0047

Project No. 706
September
09/12/90

PERCENT COM 0.00%

PROJECT DOLLARS

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																	
WALCOFF SITE:																	
Project L. Denni	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$0.00	$0.00	$2,645.00	$0.00	$2,645.00	$2,645.00	$0.00
Corporat C. Walc	$360.60	$360.60	$360.60	$360.60	$360.60	$360.60	$360.60	$360.60	$360.60	$360.60	$0.00	$0.00	$3,606.00	$0.00	$3,606.00	$3,606.00	$0.00
Administ B. Eiler	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$253.00	$0.00	$0.00	$2,530.00	$0.00	$2,530.00	$2,530.00	$0.00
Confere J. Gale	$0.00	$0.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$190.00	$0.00	$0.00	$1,520.00	$0.00	$1,520.00	$1,520.00	$0.00
Scientific S. Sarri	$1,605.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$1,070.00	$13,375.00	$0.00	$13,375.00	$13,375.00	$0.00
Interagency Coord	$0.00	$0.00	$0.00	$0.00	$913.50	$913.50	$913.50	$913.50	$0.00	$0.00	$0.00	$0.00	$3,654.00	$0.00	$3,654.00	$3,654.00	$0.00
Docume R. Trapa	$0.00	$0.00	$233.30	$233.30	$233.30	$233.30	$233.30	$233.30	$233.30	$233.30	$233.30	$233.30	$2,333.00	$0.00	$2,333.00	$2,333.00	$0.00
Junior W J. Simon	$0.00	$0.00	$0.00	$0.00	$261.00	$261.00	$261.00	$261.00	$261.00	$0.00	$0.00	$0.00	$1,305.00	$0.00	$1,305.00	$1,305.00	$0.00
Systems M. Gend	$0.00	$0.00	$0.00	$0.00	$841.50	$841.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,683.00	$0.00	$1,683.00	$1,683.00	$0.00
Producti L. Frankf	$0.00	$0.00	$0.00	$844.00	$844.00	$844.00	$844.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,376.00	$0.00	$3,376.00	$3,376.00	$0.00
Informati J. Gillila	$0.00	$520.00	$520.00	$520.00	$520.00	$520.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,600.00	$0.00	$2,600.00	$2,600.00	$0.00
Confere B. Zidek	$0.00	$0.00	$254.80	$254.80	$254.80	$254.80	$254.80	$0.00	$0.00	$0.00	$0.00	$0.00	$1,274.00	$0.00	$1,274.00	$1,274.00	$0.00
Administ CY/KS	$502.00	$502.00	$502.00	$502.00	$502.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,510.00	$0.00	$2,510.00	$2,510.00	$0.00
Data Ent S. Hulve	$0.00	$404.00	$404.00	$404.00	$404.00	$404.00	$404.00	$404.00	$404.00	$404.00	$404.00	$0.00	$4,040.00	$0.00	$4,040.00	$4,040.00	$0.00
Proofrea AR/	$0.00	$0.00	$234.20	$234.20	$234.20	$234.20	$234.20	$0.00	$0.00	$0.00	$0.00	$0.00	$1,171.00	$0.00	$1,171.00	$1,171.00	$0.00
Word Pr R. Wohlf	$0.00	$0.00	$432.80	$432.80	$432.80	$432.80	$432.80	$0.00	$0.00	$0.00	$0.00	$0.00	$2,164.00	*******	$2,164.00	$2,164.00	$0.00
GOVERNMENT SITE:																	
Legal Assistant	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,250.00	$0.00	$6,250.00	$6,250.00	$0.00
Office Assistant	$913.00	$913.00	$913.00	$913.00	$913.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4,565.00	$0.00	$4,565.00	$4,565.00	$0.00
OFF SITE:																	
Economic Assess	$0.00	$0.00	$0.00	$0.00	$769.20	$769.20	$769.20	$769.20	$769.20	$0.00	$0.00	$0.00	$3,846.00	$0.00	$3,846.00	$3,846.00	$0.00
TOTAL DIRECT L	**$5,148.10**	**$5,537.10**	**$6,882.20**	**$7,726.20**	**$10,511.40**	**$7,846.40**	**$6,484.90**	**$4,719.10**	**$3,805.60**	**$2,775.40**	**$1,707.30**	**$1,303.30**	**$64,447.00**	**$0.00**	**$64,447.00**	**$64,447.00**	**$0.00**

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 006
Contract No. OC-K-LDN-0047

Project No. 706
September
09/12/90

OVERHEAD

Walcoff	91.18%	$2,721.81	$3,076.50	$4,302.97	$5,072.53	$6,910.71	$6,452.99	$5,211.58	$3,601.52	$2,768.59	$2,530.61	$1,556.72	$1,188.35	$45,394.88	$0.00	$45,394.88	$45,390.00	$4.88
Govern	33.97%	$734.77	$734.77	$734.77	$734.77	$996.07	$261.30	$261.30	$261.30	$261.30	$0.00	$0.00	$0.00	$4,980.35	$0.00	$4,980.35	$4,980.00	$0.35
TOTAL OVERH		$3,456.58	$3,811.27	$5,037.74	$5,807.30	$7,906.78	$6,714.29	$5,472.88	$3,862.82	$3,029.89	$2,530.61	$1,556.72	$1,188.35	$50,375.23	$0.00	$50,375.23	$50,370.00	$5.23
Travel																		
Airfare		$0.00	$0.00	$0.00	$0.00	$0.00	$3,154.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,154.00	$0.00	$3,154.00	$3,154.00	$0.00
Ground Transpor		$0.00	$0.00	$0.00	$0.00	$0.00	$440.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$440.00	$0.00	$440.00	$440.00	$0.00
Per diem		$0.00	$0.00	$0.00	$0.00	$0.00	$1,594.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,594.00	$0.00	$1,594.00	$1,594.00	$0.00
TOTAL TRAVEL		$0.00	$0.00	$0.00	$0.00	$0.00	$5,188.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,188.00	$0.00	$5,188.00	$5,188.00	$0.00
OTHER DIRECT COSTS																		
Computer Equipm		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Local Transportati		$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$144.00	$0.00	$144.00	$144.00	$0.00
Courier/Delivery		$20.00	$20.00	$20.00	$20.00	$16.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$96.00	$0.00	$96.00	$96.00	$0.00
Postage		$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$0.00	$0.00	$100.00	$0.00	$100.00	$100.00	$0.00
Long Distance Tel		$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$89.00	$0.00	$1,589.00	$0.00	$1,589.00	$1,589.00	$0.00
Reporduction		$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$600.00	$0.00	$600.00	$600.00	$0.00
Materials & Suppli		$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$0.00	$0.00	$500.00	$0.00	$500.00	$500.00	$0.00
Printing		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL OTHER DI		$292.00	$292.00	$292.00	$292.00	$288.00	$272.00	$272.00	$272.00	$272.00	$272.00	$151.00	$62.00	$3,029.00	$0.00	$3,029.00	$3,029.00	$0.00
SUBTOTAL COST		$8,896.68	$9,640.37	$12,211.94	$13,825.50	$18,706.18	$20,020.69	$12,229.78	$8,853.92	$7,107.49	$5,578.01	$3,415.02	$2,553.65	$123,039.23	$0.00	$123,039.23	$123,034.00	$5.23
G & A	15.28%	$1,359.41	$1,473.05	$1,865.98	$2,112.54	$2,858.30	$3,059.16	$1,868.71	$1,352.88	$1,086.02	$852.32	$521.82	$390.20	$18,800.39	$0.00	$18,800.39	$18,800.00	$0.39
TOTAL COSTS		$10,256.09	$11,113.42	$14,077.92	$15,938.04	$21,564.48	$23,079.85	$14,098.49	$10,206.80	$8,193.51	$6,430.33	$3,936.84	$2,943.85	$141,839.62	$0.00	$141,839.62	$141,834.00	$5.62
FEE	8.00%	$820.49	$889.07	$1,126.23	$1,275.04	$1,725.16	$1,846.39	$1,127.88	$816.54	$655.48	$514.43	$314.95	$235.51	$11,347.17	$0.00	$11,347.17	$11,347.00	$0.17
TOTAL COSTS & F		$11,076.58	$12,002.49	$15,204.15	$17,213.08	$23,289.64	$24,926.24	$15,226.37	$11,023.34	$8,848.99	$6,944.76	$4,251.79	$3,179.36	$153,186.79	$0.00	$153,186.79	$153,181.00	$5.79

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 007
Contract No. OC-K-LDN-0047

Project No. 707

September
09/12/90

PERCENT COM 0.00%

PROJECT HOURS

		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																		
Project Manag	L. Denni	10	10	10	10	10	10	10	10	10	10	10	10	120	0.00	120.00	120.00	0.00
Corporate Mon	C. Walc	10	0	10	10	10	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Administrative	B. Eiler	10	10	10	10	0	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Contracts Adm	K. Chara	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Document Ma	R. Trapa	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Junior Writer	J. Simon	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0.00
Database Man	M. Gend	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0.00
Production Ma	L. Frankf	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Information Sp	J. Gillila	10	10	10	10	10	10	10	10	0	0	0	0	80	0.00	80.00	80.00	0.00
Administrative	CY/KS	10	10	10	10	10	10	10	10	10	10	10	10	120	0.00	120.00	120.00	0.00
Date Entry	S. Hulve	10	10	10	10	10	10	10	10	10	10	10	10	120	0.00	120.00	120	0.00
Proofreader	AR/	0	0	0	10	10	10	10	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Word Process	R. Wohlf	0	0	0	10	10	10	10	0	0	0	0	0	40	0.00	40.00	40.00	0.00
TOTAL DIRECT LABOR		60	50	60	80	70	60	60	40	30	30	30	30	600	0.00	600.00	600.00	0.00

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 007
Contract No. OC-K-LDN-0047

Project No. 707
September
09/12/90

PERCENT COM 0.00%

PROJECT DOLLARS		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																		
Project Manag	L. Denni	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$3,174.00	$0.00	$3,174.00	$3,174.00	$0.00
Corporate Mon	C. Walc	$389.40	$0.00	$389.40	$389.40	$389.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,557.60	$0.00	$1,557.60	$1,558.00	($0.40)
Administrative	B. Eiler	$253.00	$253.00	$253.00	$253.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,012.00	$0.00	$1,012.00	$1,012.00	$0.00
Contracts Adm	K. Chara	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Document Ma	R. Trapa	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Junior Writer	J. Simon	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Database Man	M. Gend	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Production Ma	L. Frankf	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Information Sp	J. Gillila	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$0.00	$0.00	$0.00	$0.00	$1,040.00	$0.00	$1,040.00	$1,040.00	$0.00
Administrative	CY/KS	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$125.50	$1,506.00	$0.00	$1,506.00	$1,506.00	$0.00
Date Entry	S. Hulve	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$101.00	$1,212.00	$0.00	$1,212.00	$1,212.00	$0.00
Proofreader	AR/	$0.00	$0.00	$0.00	$130.50	$130.50	$130.50	$130.50	$0.00	$0.00	$0.00	$0.00	$0.00	$522.00	$0.00	$522.00	$522.00	$0.00
Word Process	R. Wohlf	$0.00	$0.00	$0.00	$110.60	$110.60	$110.60	$110.60	$0.00	$0.00	$0.00	$0.00	$0.00	$442.40	$0.00	$442.40	$442.00	$0.40
TOTAL DIRECT LABOR		**$1,263.40**	**$874.00**	**$1,263.40**	**$1,504.50**	**$1,251.50**	**$862.10**	**$862.10**	**$621.00**	**$491.00**	**$491.00**	**$491.00**	**$491.00**	**$10,466.00**	**$0.00**	**$10,466.00**	**$10,466.00**	**$0.00**
OVERHEAD	**91.18%**	**$1,151.97**	**$796.91**	**$1,151.97**	**$1,371.80**	**$1,141.12**	**$786.06**	**$786.06**	**$566.23**	**$447.69**	**$447.69**	**$447.69**	**$447.69**	**$9,542.88**	**$0.00**	**$9,542.88**	**$9,542.00**	**$0.88**
Travel																		
Airfare		$0.00	$0.00	$0.00	$1,900.00	$0.00	$0.00	$0.00	$1,900.00	$0.00	$0.00	$0.00	$0.00	$3,800.00	$0.00	$3,800.00	$3,800.00	$0.00
Ground Transporation		$0.00	$0.00	$0.00	$160.00	$0.00	$0.00	$0.00	$160.00	$0.00	$0.00	$0.00	$0.00	$320.00	$0.00	$320.00	$320.00	$0.00
Per diem		$0.00	$0.00	$0.00	$508.00	$0.00	$0.00	$0.00	$508.00	$0.00	$0.00	$0.00	$0.00	$1,016.00	$0.00	$1,016.00	$1,016.00	$0.00
TOTAL TRAVEL		**$0.00**	**$0.00**	**$0.00**	**$2,568.00**	**$0.00**	**$0.00**	**$0.00**	**$2,568.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$5,136.00**	**$0.00**	**$5,136.00**	**$5,136.00**	**$0.00**
OTHER DIRECT COSTS																		
Computer Equipment		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Local Transportation (St		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Courier/Delivery		$14.00	$14.00	$14.00	$14.00	$14.00	$14.00	$14.00	$14.00	$0.00	$0.00	$0.00	$0.00	$112.00	$0.00	$112.00	$112.00	$0.00
Postage		$0.00	$10.00	$10.00	$10.00	$10.00	$10.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$50.00	$0.00	$50.00	$50.00	$0.00
Long Distance Telephon		$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00	$45.00	$0.00	$545.00	$0.00	$545.00	$545.00	$0.00
Reporduction		$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$30.00	$0.00	$0.00	$300.00	$0.00	$300.00	$300.00	$0.00
Materials & Supplies		$50.00	$0.00	$0.00	$50.00	$0.00	$0.00	$50.00	$0.00	$0.00	$0.00	$0.00	$0.00	$150.00	$0.00	$150.00	$150.00	$0.00
EXPERTS		$0.00	$30,000.00	$0.00	$30,000.00	$0.00	$30,000.00	$0.00	$30,000.00	$0.00	$30,000.00	$0.00	$0.00	$150,000.00	$0.00	$150,000.00	$150,000.00	$0.00
TOTAL OTHER DIREC		**$144.00**	**$30,104.00**	**$104.00**	**$30,154.00**	**$104.00**	**$30,104.00**	**$144.00**	**$30,094.00**	**$80.00**	**$30,080.00**	**$45.00**	**$0.00**	**$151,157.00**	**$0.00**	**$151,157.00**	**$151,157.00**	**$0.00**
SUBTOTAL COSTS		**$2,559.37**	**$31,774.91**	**$2,519.37**	**$35,596.30**	**$2,496.62**	**$31,752.16**	**$1,792.16**	**$33,849.23**	**$1,018.69**	**$31,018.69**	**$983.69**	**$938.69**	**$176,301.88**	**$0.00**	**$176,301.88**	**$176,301.00**	**$0.88**
G & A	**15.28%**	**$391.07**	**$4,855.21**	**$384.96**	**$5,439.42**	**$381.48**	**$4,851.73**	**$273.84**	**$5,172.16**	**$155.66**	**$4,739.66**	**$150.31**	**$143.43**	**$26,938.93**	**$0.00**	**$26,938.93**	**$26,939.00**	**($0.07)**
TOTAL COSTS		**$2,950.44**	**$36,630.12**	**$2,904.33**	**$41,037.72**	**$2,878.10**	**$36,603.89**	**$2,066.00**	**$39,021.39**	**$1,174.35**	**$35,758.35**	**$1,134.00**	**$1,082.12**	**$203,240.81**	**$0.00**	**$203,240.81**	**$203,240.00**	**$0.81**
FEE	**8.00%**	**$236.04**	**$2,930.41**	**$232.35**	**$3,283.02**	**$230.25**	**$2,928.31**	**$165.28**	**$3,121.71**	**$93.95**	**$2,860.67**	**$90.72**	**$86.57**	**$16,259.28**	**$0.00**	**$16,259.28**	**$16,259.00**	**$0.28**
TOTAL COSTS & FEE		**$3,186.48**	**$39,560.53**	**$3,136.68**	**$44,320.74**	**$3,108.35**	**$39,532.20**	**$2,231.28**	**$42,143.10**	**$1,268.30**	**$38,619.02**	**$1,224.72**	**$1,168.69**	**$219,500.09**	**$0.00**	**$219,500.09**	**$219,499.00**	**$1.09**

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 008
Contract No. OC-K-LDN-0047

Project No. 708

September
09/12/90

PERCENT COM 0.00%

PROJECT HOURS

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																		
Project Manag	L. Denni	0	2	2	2	2	2	2	2	2	2	2	0	20	0.00	20.00	20.00	0.00
Corporate Mon	C. Walc	0	1	1	1	1	1	1	1	1	1	1	0	10	0.00	10.00	10.00	0.00
Administrative	B. Eller	0	1	1	1	1	1	1	1	1	1	1	0	10	0.00	10.00	10.00	0.00
Contracts Adm	K. Chara	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Document Ma	R. Trapa	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Junior Writer	J. Simon	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0.00
Database Man	M. Gend	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0.00
Production Ma	L. Frankf	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Information Sp	J. Gillila	0	2	2	2	2	2	2	2	2	2	2	0	20	0.00	20.00	20.00	0.00
Administrative	CY/KS	0	2	2	2	2	2	2	2	2	2	2	0	20	0.00	20.00	20.00	0.00
Date Entry	S. Hulve	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0	0.00
Proofreader	AR/	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Word Process	R. Wohlf	0	2	2	2	2	2	2	2	2	2	2	0	20	0.00	20.00	20.00	0.00
TOTAL DIRECT LABOR		0	10	10	10	10	10	10	10	10	10	10	0	100	0.00	100.00	100.00	0.00

Walcoff & Associates, Inc.

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PROJECT DOLLARS

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																	
Project Manag L. Denni	$0.00	$52.90	$52.90	$52.90	$52.90	$52.90	$52.90	$52.90	$52.90	$52.90	$52.90	$0.00	$529.00	$0.00	$529.00	$529.00	$0.00
Corporate Mon C. Walc	$0.00	$38.94	$38.94	$38.94	$38.94	$38.94	$38.94	$38.94	$38.94	$38.94	$38.94	$0.00	$389.40	$0.00	$389.40	$389.00	$0.40
Administrative B. Eiler	$0.00	$25.30	$25.30	$25.30	$25.30	$25.30	$25.30	$25.30	$25.30	$25.30	$25.30	$0.00	$253.00	$0.00	$253.00	$253.00	$0.00
Contracts Adm K. Chara	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Document Ma R. Trapa	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Junior Writer J. Simon	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Database Man M. Gend	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Production Ma L. Frankl	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Information Sp J. Gillila	$0.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$26.00	$0.00	$260.00	$0.00	$260.00	$260.00	$0.00
Administrative CY/KS	$0.00	$25.10	$25.10	$25.10	$25.10	$25.10	$25.10	$25.10	$25.10	$25.10	$25.10	$0.00	$251.00	$0.00	$251.00	$251.00	$0.00
Date Entry S. Hulve	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Proofreader AR/	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Word Process R. Wohlf	$0.00	$20.20	$20.20	$20.20	$20.20	$20.20	$20.20	$20.20	$20.20	$20.20	$20.20	$0.00	$202.00	$0.00	$202.00	$202.00	$0.00
TOTAL DIRECT LABOR	$0.00	$188.44	$188.44	$188.44	$188.44	$188.44	$188.44	$188.44	$188.44	$188.44	$188.44	$0.00	$1,884.40	$0.00	$1,884.40	$1,884.00	$0.40
OVERHEAD 91.18%	$0.00	$171.82	$171.82	$171.82	$171.82	$171.82	$171.82	$171.82	$171.82	$171.82	$171.82	$0.00	$1,718.20	$0.00	$1,718.20	$1,718.00	$0.20
Travel																	
Airfare	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ground Transporation	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Per diem	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL TRAVEL	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OTHER DIRECT COSTS																	
Computer Equipment	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Local Transportation (St	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$12.00	$144.00	$0.00	$144.00	$144.00	$0.00
Courier/Delivery	$0.00	$11.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.00	$0.00	$11.00	$11.00	$0.00
Postage	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$24.00	$0.00	$24.00	$21.00	$3.00
Long Distance Telephon	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$4.00	$0.00	$54.00	$0.00	$54.00	$54.00	$0.00
Reporduction	$0.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$5.00	$0.00	$0.00	$45.00	$0.00	$45.00	$45.00	$0.00
Materials & Supplies	$0.00	$20.00	$0.00	$0.00	$0.00	$20.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$40.00	$0.00	$40.00	$40.00	$0.00
EXPERTS	$0.00	$0.00	$3,000.00	$0.00	$3,000.00	$0.00	$3,000.00	$0.00	$3,000.00	$0.00	$1,200.00	$0.00	$13,200.00	$0.00	$13,200.00	$13,200.00	$0.00
TOTAL OTHER DIREC	$19.00	$55.00	$3,024.00	$24.00	$3,024.00	$44.00	$3,024.00	$24.00	$3,024.00	$24.00	$1,218.00	$14.00	$13,518.00	$0.00	$13,518.00	$13,515.00	$3.00
SUBTOTAL COSTS	$19.00	$415.26	$3,384.26	$384.26	$3,384.26	$404.26	$3,384.26	$384.26	$3,384.26	$384.26	$1,578.26	$14.00	$17,120.60	$0.00	$17,120.60	$17,117.00	$3.60
G & A 15.28%	$2.90	$63.45	$517.11	$58.71	$517.11	$61.77	$517.11	$58.71	$517.11	$58.71	$241.16	$2.14	$2,615.99	$0.00	$2,615.99	$2,615.00	$0.99
TOTAL COSTS	$21.90	$478.71	$3,901.37	$442.97	$3,901.37	$466.03	$3,901.37	$442.97	$3,901.37	$442.97	$1,819.42	$16.14	$19,736.59	$0.00	$19,736.59	$19,732.00	$4.59
FEE 8.00%	$1.75	$38.30	$312.11	$35.44	$312.11	$37.28	$312.11	$35.44	$312.11	$35.44	$145.55	$1.29	$1,578.93	$0.00	$1,578.93	$1,579.00	($0.07
TOTAL COSTS & FEE	$23.65	$517.01	$4,213.48	$478.41	$4,213.48	$503.31	$4,213.48	$478.41	$4,213.48	$478.41	$1,964.97	$17.43	$21,315.52	$0.00	$21,315.52	$21,311.00	$4.52

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 009
Contract No. OC-K-LDN-0047

Project No. 709

September
09/12/90

PERCENT COM 0.00%

PROJECT HOURS

		JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																		
Project Manag	L. Denni	0	10	10	10	10	10	10	10	10	0	0	0	80	0.00	80.00	80.00	0.00
Corporate Mon	C. Walc	0	10	10	10	10	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Administrative	B. Eller	0	10	10	0	0	0	0	0	0	0	0	0	20	0.00	20.00	20.00	0.00
Scientific Asse	S. Sarri	0	10	10	10	10	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Document Ma	R. Trapa	0	0	10	10	10	0	0	0	0	0	0	0	30	0.00	30.00	30.00	0.00
Senior Writer	J. Conn	20	20	20	20	20	0	0	0	0	0	0	0	100	0.00	100.00	100.00	0.00
Graphic Desig	D. Hoff	30	30	30	30	0	0	0	0	0	0	0	0	120	0.00	120.00	120.00	0.00
Production Ma	L. Frankl	0	0	20	20	0	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Information Sp	J. Gillila	0	10	10	0	0	0	0	0	0	0	0	0	20	0.00	20.00	20.00	0.00
Administrative	CY/KS	10	10	10	10	0	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Data Entry	S. Hulve	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Proofreader	AR/	0	0	20	20	0	0	0	0	0	0	0	0	40	0.00	40.00	40.00	0.00
Word Process	R. Wohlf	0	0	20	20	20	0	0	0	0	0	0	0	60	0.00	60.00	60.00	0.00
TOTAL DIRECT LABOR		**60**	**110**	**180**	**160**	**80**	**10**	**10**	**10**	**10**	**0**	**0**	**0**	**630**	**0.00**	**630.00**	**630.00**	**0.00**

Walcoff & Associates, Inc.

DOJ - Litigation Support
TASK 009
Contract No. OC-K-LDN-0047

Project No. 709
September
09/12/90

PERCENT COM 0.00%

PROJECT DOLLARS

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Estimate Complete	Total urred	Estimated Total	Contract Total	udget riance
DIRECT LABOR																	
Project Manag L. Denni	$0.00	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$264.50	$0.00	$0.00	$0.00	$2,116.00	$0.00	$2,116.00	$2,116.00	$0.00
Corporate Mon C. Walc	$0.00	$389.40	$389.40	$389.40	$389.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,557.60	$0.00	$1,557.60	$1,558.00	($0.40)
Administrative B. Eiler	$0.00	$253.00	$253.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$506.00	$0.00	$506.00	$506.00	$0.00
Scientific Asse S. Sarri	$0.00	$252.90	$252.90	$252.90	$252.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,011.60	$0.00	$1,011.60	$1,012.00	($0.40)
Document Ma R. Trapa	$0.00	$0.00	$233.30	$233.30	$233.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$699.90	$0.00	$699.90	$700.00	($0.10)
Senior Writer J. Conn	$310.60	$310.60	$310.60	$310.60	$310.60	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,553.00	$0.00	$1,553.00	$1,553.00	$0.00
Graphic Desig D. Hoff	$364.80	$364.80	$364.80	$364.80	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,459.20	$0.00	$1,459.20	$1,459.00	$0.20
Production Ma L. Frankl	$0.00	$0.00	$337.60	$337.60	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$675.20	$0.00	$675.20	$675.00	$0.20
Information Sp J. Gillila	$0.00	$130.00	$130.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$260.00	$0.00	$260.00	$260.00	$0.00
Administrative CY/KS	$125.50	$125.50	$125.50	$125.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$502.00	$0.00	$502.00	$502.00	$0.00
Data Entry S. Hulve	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Proofreader AR/	$0.00	$0.00	$261.00	$261.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$522.00	$0.00	$522.00	$522.00	$0.00
Word Process R. Wohlf	$0.00	$0.00	$202.00	$202.00	$202.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$606.00	$0.00	$606.00	$606.00	$0.00
TOTAL DIRECT LABOR	$800.90	$2,090.70	$3,124.60	$2,741.60	$1,652.70	$264.50	$264.50	$264.50	$264.50	$0.00	$0.00	$0.00	$11,468.50	$0.00	$11,468.50	$11,469.00	($0.50)
OVERHEAD 91.18%	$730.26	$1,906.30	$2,849.01	$2,499.79	$1,506.93	$241.17	$241.17	$241.17	$241.17	$0.00	$0.00	$0.00	$10,456.97	$0.00	$10,456.97	$10,456.00	$0.97
Travel																	
Airfare	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ground Transporation	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Per diem	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL TRAVEL	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OTHER DIRECT COSTS																	
Computer Equipment	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Local Transportation (St	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$6.00	$72.00	$0.00	$72.00	$72.00	$0.00
Courier/Delivery	$24.00	$24.00	$24.00	$24.00	$24.00	$24.00	$24.00	$24.00	$24.00	$24.00	$0.00	$0.00	$240.00	$0.00	$240.00	$240.00	$0.00
Postage	$3.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$25.00	$0.00	$25.00	$25.00	$0.00
Long Distance Telephon	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$10.00	$12.00	$0.00	$0.00	$0.00	$0.00	$82.00	$0.00	$82.00	$82.00	$0.00
Reporduction	$30.00	$30.00	$30.00	$30.00	$10.00	$10.00	$10.00	$0.00	$0.00	$0.00	$0.00	$0.00	$150.00	$0.00	$150.00	$150.00	$0.00
Materials & Supplies	$50.00	$50.00	$50.00	$50.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$200.00	$0.00	$200.00	$200.00	$0.00
Printing	$0.00	$0.00	$0.00	$500.00	$0.00	$0.00	$500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,000.00	$0.00	$1,000.00	$1,000.00	$0.00
TOTAL OTHER DIREC	$123.00	$122.00	$122.00	$622.00	$52.00	$52.00	$552.00	$44.00	$32.00	$32.00	$8.00	$8.00	$1,769.00	$0.00	$1,769.00	$1,769.00	$0.00
SUBTOTAL COSTS	$1,654.16	$4,119.00	$6,095.61	$5,863.39	$3,211.63	$557.67	$1,057.67	$549.67	$537.67	$32.00	$8.00	$8.00	$23,694.47	$0.00	$23,694.47	$23,694.00	$0.47
G & A 15.28%	$252.76	$629.38	$931.41	$895.93	$490.74	$85.21	$161.61	$83.99	$82.16	$4.89	$1.22	$1.22	$3,620.52	$0.00	$3,620.52	$3,620.00	$0.52
TOTAL COSTS	$1,906.92	$4,748.38	$7,027.02	$6,759.32	$3,702.37	$642.88	$1,219.28	$633.66	$619.83	$36.89	$9.22	$9.22	$27,314.99	$0.00	$27,314.99	$27,314.00	$0.99
FEE 8.00%	$152.55	$379.87	$562.16	$540.75	$296.19	$51.43	$97.54	$50.69	$49.59	$2.95	$0.74	$0.74	$2,185.20	$0.00	$2,185.20	$2,185.00	$0.20
TOTAL COSTS & FEE	$2,059.47	$5,128.25	$7,589.18	$7,300.07	$3,998.56	$694.31	$1,316.82	$684.35	$669.42	$39.84	$9.96	$9.96	$29,500.19	$0.00	$29,500.19	$29,499.00	$1.19

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122w

Walcoff Invoice Tracking List
Date: 08/13/91

C:\123\TASKTRAK.WK1

Task Order	Description	DC #	OB #	Amount Obligated	Amount Invoiced	*Amount Remaining*	% Left	Last Invoice Dated
001	Expert Mgt./Conf. Planning	5128	0B1596 OC 2529	$72,574.70	$72,574.70	***$0.00***	0.00%	
002	Identify Toxicologist	40155	0361960421 1157	$27,095.00	$20,958.85	***$6,136.15***	22.65%	April 8, 1991
003	Identify Survey Firms	6123	0B1596 OC 2529	$99,211.00	$65,478.82	***$2,732.18***	4.01%	July 10, 1991
		6213A	0B1596 OC 2529	($31,000.00)				
004	Criminal Expert Identification	40180	0361960421 1157	$332,832.00	$284,971.62	***$47,860.38***	14.38%	August 12, 1991
005	Bird Study/ECI	6131	0B1595 OC 2529	$340,000.00	$305,611.12	***$388.88***	0.13%	July 11, 1991
			0B1596 OC 2529	$107,747.00	$119,429.03	***$1,497.97***	1.24%	
		6131A	0B1595 OC 2529	($34,000.00)				
			0B1596 OC 2529	($12,065.00)				
		7404	1B1596 OC 2529	$23,245.00				
		7404A	1B1596 OC 2529	$2,000.00				
006	Management Support	6148	0B1596 OC 2529	$153,181.00	$147,967.46	***$5,213.54***	3.40%	July 10, 1991
007	Corporate Veil research	42025	0361960421 1157	$219,499.00	$200,612.19	***$76,775.81***	27.68%	August 12, 1991
		40212	1361960421 1157	$57,889.00				
008	Subsistence Work Plan Review	6152	0B1595 OC 2529	$21,311.00	$14,050.92	***$7,260.08***	34.07%	February 13, 1991
009	COSR PR Logo Program	6153	0B1595 OC 2529	$29,499.00	$24,907.58	***$4,591.42***	15.56%	May 9, 1991
010	Toxicologist Support	42026	0361960421 1157	$11,769.00	$2,869.75	***$8,899.25***	75.62%	April 8, 1991
011	Survey Research Task	6154	0B1595 OC 2529	$531,520.00	$529,160.93	***$10,707.07***	1.98%	July 10, 1991
		7402	1B1595 OC 2529	$8,348.00				

Walcoff Invoice Tracking List

Date: 08/13/91

C:\123\TASKTRAK.WK1

Task Order	Description	DC #	OB #	Amount Obligated	Amount Invoiced	*Amount Remaining*	% Left	Last Invoice Dated
012	Mgt. of Econ. Studies	7455	0B1595 OC 2529	$181,273.00	$326,487.49	***$116,088.51***	31.89%	August 12, 1991
		10016	1B1595 OC 2529	$74,666.00				
		10016A	1B1595 OC 2529	$12,289.00				
		10016B	1B1595 OC 2529	$95,856.00				
		10016C	1B1595 OC 2529	$78,492.00				
013	Summary of NRI	7456	0B1595 OC 2529	$102,682.00	$86,566.17	***$32,246.83***	27.14%	July 19, 1991
		7427	1B1595 OC 2529	$16,131.00				
014	CV Research Task	7460	0B1595 OC 2529	$361,075.00	$409,890.76	***$30,555.24***	6.94%	August 12, 1991
		7426	1B1595 OC 2529	$79,371.00				
015	Fisheries Task	6160	0B1595 OC 2529	$55,715.00	$55,687.00	***$106,185.00***	65.60%	August 12, 1991
		7409	1B1595 OC 2529	$56,094.00				
		7409A	1B1595 OC 2529	$50,063.00				
016	Recreation Task	6161	0B1595 OC 2529	$74,001.00	$38,650.98	***$60,812.02***	61.14%	August 12, 1991
		7425	1B1595 OC 2529	$19,561.00				
		7425A	1B1595 OC 2529	$5,901.00				
017	Dysthymia Research Task	42056	0361960421 1157	$40,936.00	$15,462.55	***$25,473.45***	62.23%	May 9, 1991
018	Peer Review Meeting Task	7323	1B1596 OC 2529	$29,987.00	$12,796.25	***$17,190.75***	57.33%	July 10, 1991
019	OSPIC PR Logo Program	7349	1B1595 OC 2529	$14,163.00	$9,738.42	***$4,424.58***	31.24%	July 10, 1991
020	Conference Planning	10005	1B1598 OC 2599	$187,037.00	$158,030.75	***$29,006.25***	15.51%	June 11, 1991

Walcoff Invoice Tracking List

Date: 08/13/91

C:\123\TASKTRAK.WK1

Task Order	Description	DC #	OB #	Amount Obligated	Amount Invoiced	*Amount Remaining*	% Left	Last Invoice Dated
021	Science Peer Reviewers	735	1B1595 OC 2529	$248,898.00	$423,906.44	***$378,946.56***	47.20%	August 12, 1991
		7359A	1B1595 OC 2529	$210,360.00				
		7359B	1B1595 OC 2529	$167,900.00				
		7359C	1B1595 OC 2529	$175,695.00				
022	Subsistence Research	7366	1B1595 OC 2529	$59,506.00	$37,295.45	***$22,210.55***	37.32%	May 29, 1991
023	On-Site Support Task	7371	1B1596 OC 2529	$24,989.00	$29,123.10	***$34,368.90***	54.13%	August 12, 1991
		7371A	1B1596 OC 2529	$38,503.00				
024	Mgt. of Science Effort	7379	1B1595 OC 2529	$70,676.00	$58,260.78	***$12,415.22***	17.57%	August 12, 1991
025	John Jordan Task	7382	1B1596 OC 2529	$142,467.00	$67,276.71	***$10,687.29***	13.71%	August 12, 1991
		7382A	1B1596 OC 2529	($64,503.00)				
026	Science Literature Search	7393	1B1596 OC 2529	$19,987.00	$12,743.76	***$7,243.24***	36.24%	May 9, 1991
027	Training Analysis Task	7392	1B1596 OC 2529	$40,782.00	**$5,410.94**	***$0.06***	0.00%	**TERMINATED 2/19/91**
		7392A	1B1596 OC 2529	($35,371.00)				
028	Econ. Peer Reviewers	7403	1B1595 OC 2529	$27,085.00	$10,834.51	***$23,093.49***	68.07%	August 12, 1991
		7403A	1B1595 OC 2529	$6,843.00				
029	Archaeology Peer Review	7405	1B1595 OC 2529	$6,239.00	$1,976.11	***$4,262.89***	68.33%	July 10, 1991
030	Junior Scientist	7414	1B1595 OC 2529	$33,638.00	$2,731.30	***$30,906.70***	91.88%	August 12, 1991
031	Restoration Peer Reviewers	7420	1B1595 OC 2529	$74,679.00	$6,915.37	***$67,763.63***	90.74%	August 12, 1991

Walcoff Invoice Tracking List

Date: 08/13/91

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Task Order	Description	PO #	OP	Amount Obligated	Amount Invoiced	*Amount Remaining*	% Left	Last Invoice Dated
032	Jury Selection Support		[illegible]	$109,561.00	$0.00	***$109,561.00***	100.00%	
033	Popul[illegible]n Task		1B1595 OC 2529	$59,761.00	$0.00	***$59,761.00***	100.00%	
		Totals		**$4,913,643.70**	**$3,558,377.81**	**$1,355,265.89**		
		Percentages		**100.00%**	**72.42%**	**27.58%**		

LEGAL RESEARCH AND ANALYSIS

FOR RACHEL JACOBSEN

DEPARTMENT OF JUSTICE

Performed by:

Paul Harder
Legal Assistant
Walcoff & Associates

November 10, 1990

I. INTRODUCTION

The following research was performed by Paul Harder, Legal Assistant with Walcoff & Associates working under Contract No. OC-K-LDN-0047 for the U.S. Department of Justice. The research was performed at the request of Ms. Rachel Jacobsen, Attorney for the Department of Justice and with the approval of Ms. Christina Gardner, Case Manager and COTR for the aforementioned contract. The following information is related to ongoing litigation preparation being performed by the Department of Justice and accordingly falls under the category of **Attorney Work Product** and is not releasable under the Freedom of Information Act nor is it releasable under any Federal or State discovery rules.

II. ISSUES

Two issues are the focus of this research effort:

(A) What is the current state of the law in the Alaska Corporation Code regarding the holding of a parent corporation liable for the acts of a subsidiary? What is the law under the Alaskan state courts regarding parent-subsidiary liability? What is the law in the federal courts, specifically the 9th Circuit, of which Alaska is a member, related to parent-subsidiary liability?

(B) If it is assumed that the factual charges made in the Bill of Particulars filed by the Criminal Division of the Department of Justice on July 31, 1990 against Exxon Corporation and Exxon Shipping Company are true, what is the outcome in the state and the federal courts in ruling on whether Exxon Corporation is liable for the acts of Exxon Shipping Corporation employees as related to the Exxon Valdez oil spill?

III. FACTS

The following facts are derived from the Bill of Particulars filed by the Criminal Division of the Department of Justice against Exxon Corporation (Exxon) and Exxon Shipping Company (Exxon Shipping) in Case Nos. A90-015-1CR and A90-015-2CR, filed in the U.S. District Court for the District of Alaska.

1. On March 24, 1989, the Exxon Valdez, a tanker displaying the Exxon logo and purchased with loans underwritten by Exxon, carrying oil owned by Exxon which had been transported from the North Slope of Alaska through the Trans-Alaska Pipeline, which is partially owned by Exxon, bound for an Exxon-owned refinery in California where the product would be refined and distributed by Exxon, ran aground on Bligh Reef in Prince William Sound, spilling in excess of 10 million gallons of crude oil.

2. At the time of the accident, Exxon was a vertically-integrated energy and chemicals corporation incorporated under the laws of Delaware and with headquarters in New York, New York.

3. At the time of the accident, Exxon Shipping was a wholly-owned subsidiary of Exxon, incorporated under the laws of Delaware and with headquarters in Houston, Texas.

4. Exxon Shipping existed as a corporation since 1973, but was dormant until 1982 when Exxon transferred all of the assets from its Marine Division of Exxon U.S.A., a major division of Exxon, to Exxon Shipping. This move was performed to take advantage of recent changes in foreign tax codes. Prior to1982, Exxon Shipping had no assets of its own.

5. Upon activation of Exxon Shipping, Exxon installed a Board of Directors for Exxon Shipping and named an Exxon Senior Vice President as the Exxon official responsible in overseeing the activities of Exxon Shipping. At some time after its creation but prior to the accident, Exxon reduced the Board of Directors of Exxon Shipping to one member.

6. Exxon Shipping maintained the same offices held by the Marine Division of Exxon U.S.A. in the Exxon U.S.A. headquarters in Houston, Texas in 1982 until the time of the accident.

7. Significantly all of Exxon Shipping's business was the transport of Exxon products within the U.S. territorial waters. Third-party contracts made up a de minimis portion of total revenues.

8. All policy and operational decisions by the Exxon Shipping Board of Directors required review and approval by Exxon officials prior to implementation. All policies were required to be in conformance with Exxon mandates.

9. All shipping contracts between Exxon Shipping and either other Exxon division or subsidiaries or third parties required approval by Exxon officials.

10. Exxon Shipping depended on Exxon for financing essential to Exxon Shipping's business, through unconditional loan guarantees for large capital investments and through direct loans from Exxon for small capital investments.

11. Exxon Shipping relied on Exxon to provide essential administrative support services, including such services as: accounting, financial, banking, corporate planning, computer and telecommunications, employee relations, public affairs, medical, purchasing, tax, legal and risk management.

12. In 1986, Exxon approved the construction of and guaranteed over $100 million in loans for Exxon Shipping to purchase two Very Large Crude Carriers (VLCC), the Exxon Valdez and the Exxon Long Beach. Exxon proclaimed the Exxon Valdez in its 1986 Annual Report as "the largest in Exxon's U.S. flag fleet" while displaying a color photograph of the recently completed Exxon Valdez.

13. Both Exxon and Exxon Shipping were foreign corporations properly admitted to the State of Alaska to do business as specified under §10.06.705 of the Alaska Statutes.

IV. ISSUE A
STATE OF THE LAW

(A) What is the current state of the law in the Alaska Corporation Code regarding the holding of a parent corporation liable for the acts of a subsidiary? What is the law under the Alaskan state courts regarding parent-subsidiary liability? What is the law in the federal courts, specifically the 9th Circuit, of which Alaska is a member, related to parent-subsidiary liability?

The following discussion shall focus on three major aspects of the law of parent-subsidiary liability at the time of the Exxon Valdez accident: the Alaska Statutes, the Alaska State Common Law, and the Federal court rulings, with specific emphasis on the 9th circuit.

1. ALASKA CORPORATE CODE

The Alaska Statutes, Title 10, Chapter 6 entitled "Alaska Corporations Code," is moot as to the holding of parent corporations liable for the acts of subsidiaries. Article 10 of the Code, entitled "Foreign Corporations," discusses the situations where a foreign corporation's activities in the State of Alaska do not constitute "transacting business" in the state. AS §10.06.718. Specifically, the section states that "a foreign corporation is not considered to be transacting business in this state . . . by reason of carrying on in this state . . . (9) transacting business in interstate commerce." AS §10.06.718(9). This section pertains only to the transaction of business as it relates to the power of the state to require the foreign corporation to obtain a certificate of authority to transact business in the state and does not pertain to those activities which might subject a foreign corporation to the jurisdiction of Alaska law. Weaver v. O'Meara Motor Co., 452 P.2d 87 (Alaska 1969).

As cited above in Fact No. 13, both Exxon and Exxon Shipping had secured the proper certifications to transact business in Alaska.

2. ALASKA COMMON LAW

Jackson v. General Electric Company, 514 P.2d 1170 (Alaska 1973).

Plaintiff Jackson bought a General Electric appliance from a retail store in Texas. The retailer made a credit arrangement through General Electric Credit Corporation (GECC), a wholly-owned subsidiary of General Electric Company (GE). Two years after the sale, GECC sent a defamatory collection to plaintiff's military superiors. Appellant brought action against GE and not GECC because at the time of trial, GE was licensed to do business in Alaska but GECC was not. At trial, the judge ruled that GE should not be held liable for the defamatory letter sent by GECC on the following grounds, derived from the GECC prospectus filed with the SEC:

1. GECC carried on two principle lines of business consisting of consumer and commercial financing.

2. GECC provides inventory financing for over 6,500 dealers in home products purchased from various manufacturers, the great majority of which is for products manufactured by GE.

3. GECC maintains a substantial operation in commercial and industrial financing. No evidence showed any substantial amount of this activity involving GE products.

4. As of September 26, 1970, 7% of GECC's consumer and retail receivables outstanding were attributable to GE products and 56% of dealer inventory financing was related to GE products. Approximately 2% of its commercial and industrial receivables were attributable to the financing of GE equipment.

5. Consolidated income tax returns are filed by the two companies.

6. GE furnishes advisory services to GECC, including services in accounting, tax, legal, marketing, employee and community relations, and auditing functions. All of GECC's directors and officers were former GE employees.

7. The earnings for GECC are reflected in financial reports of GE in determining GE's annual income.

8. GECC is not underfinanced, its creditors are not disadvantaged and the corporation is solvent.

In the Supreme Court of Alaska on appeal, the court discussed two means by which a parent corporation may be held liable for its subsidiary's conduct. First, liability may be found where the parent corporation "uses a separate corporate form to defeat public convention, justify wrong, commit fraud or defend crime." Jackson supra at 1172, 1173, citing Steven v. Roscoe Turner Aeronautical Corp., 324 F.2d 157, 160 (7th Cir. 1963). Second, "the parent corporation may also be liable for the wrongful conduct of its subsidiary when the subsidiary is the mere instrumentality of the parent." Jackson supra at 1173.

The court focuses on the "mere instrumentality" issue as the issue in the case. Citing Professor Powell's treatise, Parent and Subsidiary Corporations §5-6 (1931) and Taylor v. Standard Gas & Electric Co., 96 F.2d 693 (10th Cir. 1938), the court utilized Powell's eleven point criteria under which a subsidiary acts as the mere instrumentality of its parent:

1. The parent corporation owns all or most of the capital stock of the subsidiary.
2. The parent and subsidiary corporation have common directors or officers.
3. The parent corporation finances the subsidiary.
4. The parent corporation subscribes to all the capital stock of the subsidiary or otherwise causes its incorporation.
5. The subsidiary has grossly inadequate capital.
6. The parent corporation pays the salaries and other expenses or losses of the subsidiary.
7. The subsidiary has substantially no business except with the parent corporation or no assets except those conveyed to it by the parent corporation.
8. In the papers of the parent corporation or in the statements of its officers, the subsidiary is described as a department or division of the parent corporation, or its business or financial responsibility is referred to as the parent corporation's own.
9. The parent corporation uses the property of the subsidiary as its own.
10. The directors or executives of the subsidiary do not act independently in the interest of the subsidiary but take their orders from the parent corporation in the latter's interest.
11. The formal legal requirements of the subsidiary are not observed.

The court observed that "it is not necessary, of course, that all eleven of these factors be found in order to conclude that the subsidiary is the mere instrumentality of its parent. A parent corporation which does not permit its subsidiary to exercise an individual status may not expect that the subsidiary's independence will be recognized elsewhere."

The court relied heavily on the amount of financing GECC provided not related to GE products in upholding the trial court's determination. However, the court conceded that "an opposite result could conceivably have been reached by us if we were serving as the trial court." Jackson supra at 1174.

McKibben v. Mohawk Oil Company, Ltd., 667 P.2d 1223 (Alaska 1983)

This case arose out of a mining claim dispute between mining lease assignees as plaintiffs and a joint venture and its subsidiary as defendants. The court here cited Jackson v. General Electric Co. and its eleven point criteria as the method by which parent corporation liability for the acts of its subsidiaries shall be analyzed in the state of Alaska. The court used this criteria to find Mohawk Ltd., the joint venture parent corporation, liable for the actions of its subsidiary, Mohawk Inc.

3. FEDERAL COURT DECISIONS

The federal courts, while bound to review cases in terms of the state law in which the injury took place, have made general rulings regarding parent-subsidiary liability. Of focus here is the treatment of the issue in the 9th Circuit, of which Alaska is a member.

Taylor v. Standard Gas & Electric Co. 96 F.2d 693 (10th Cir. 1938)

The grandfather of parent-subsidiary liability cases, this case arose out of a bankruptcy reorganization plan to reorganize Deep Rock Oil Corporation. Standard Gas was a creditor to Deep Rock and demanded interest in the reorganized organization. The concern of the court was the level of control that Standard Gas would exercise over Deep Rock, possibly making Deep Rock a mere instrumentality of Standard Gas in the process.

Here, the court uses the eleven point criteria established by Professor Powell in his treatise on Parent and Subsidiary Corporations as the touchstone by which the parent-subsidiary liability issue should be analyzed. See above for criteria Jackson, supra, at 1172; Taylor, supra, at 704, 705. The court notes that the parent corporation's provisioning of funding to the subsidiary, the existence of total stock ownership, and common personnel will not render a subsidiary a "mere instrumentality" of the parent. Rather, the court stated that:

> Where, however, the relations between parent and subsidiary are so intimate, the control of the former over the latter so dominating, and the business and assets of the two so commingled, that the recognition of distinct entity will result in wrong or injustice to third persons, courts should look through the fiction of distinct entity and deal with the situation as justice requires. Taylor, supra, at 706.

Krivo Industrial Supply Co. v. National Distillers and Chemical Corp., 483 F.2d 1098 (5th Cir. 1973)

Again, in a creditor action against a bankrupt debtor in reorganization, the defendant is accused of controlling debtor bankrupt corporation to the extent that it was a "mere instrumentality" of the defendant parent corporation. The court reduces the "instrumentality" rule to a two part test to show that the court should disregard the separate corporate forms:

1. ". . . the control required for liability under the 'instrumentality' rule amounts to total domination of the subservient corporation, to the extent that the subservient corporation manifests no separate corporate interests of its won and functions solely to achieve the purposes of the dominant corporation." Krivo, supra, at 1106.

2. " . . . the 'instrumentality' rule also requires . . . that courts may decline to recognize corporate existence whenever recognition of the corporate form would extend the principle of corporate form 'beyond its legitimate purposes and [would] produce injustices or inequitable consequences." Krivo, supra, at 1106

Here, the need to show that the failure to "pierce the corporate veil" would work some injustice or inequity differs from the rule expressed previously in Taylor, supra and in the Alaskan state cases. It is interesting to note the statement cited in Krivo from Professor Fletcher's treatise, Cyclopedia of the Law of Private Corporations, §43 at 204, 205 (perm. ed. rev. 1963):

> The control necessary to invoke what is sometimes called the "instrumentality rule" is not mere majority or complete stock control but such domination of finances, policies and practices that the controlled corporation has, so to speak, no separate mind, will or existence of its own and is but a business conduit for its principal. Krivo, supra, at 1106.

From Krivo we draw the two distinct requirements of the "instrumentality" rule, especially the level of control needed to be proven in order to hold a parent company liable for the acts of its subsidiary.

Krivo was cited in Baker v. Raymond International, Inc., 656 F.2d 173 (5th Cir. 1981) as compelling precedent. Baker involved an action for recovery of damages for injuries sustained by a seaman while working on a barge. The seaman plaintiff sued both the barge owner and its parent corporation. The court held the barge owner was the mere instrumentality of the parent corporation due to the parent's complete control of the finances and policies of the subsidiary.

Kilkenny v. Arco Marine, Inc., 800 F.2d 853 (9th Cir. 1986)

This case involved the estate of a diver who died while servicing a tanker, the Arco Alaska, in Alaskan waters. Plaintiff sued Arch Tankers, the builder and owner of the vessel, Arco Marine, the operator of the tanker, and Atlantic Richfield Co., the oil giant who was the parent corporation of Arco Marine.

Important in this case is the citing of Krivo Industrial Supply Co. v. National Distillers and Chemical Corp., supra, and Baker v. Raymond International, Inc., supra, in holding that:

> The alter ego doctrine requires that the controlling corporate entity exercise "total domination of the subservient corporation, to the extent that the subservient corporation manifests no separate corporate interests of its own and functions solely to achieve the purposes of the dominant corporation. Kilkenny at 859.

The court also cited another 9th Circuit case, Edwin K. Williams & Co. v. Edwin K. Williams & Co.-East, 542 F.2d 1053 (9th Cir 1976), in finding that as part of the "alter ego" argument: "Corporate separateness is respected unless doing so would work injustice upon an innocent third party." Kilkenny, supra, at 859.

The court found that the only facts presented by Kilkenny to support the "alter ego" argument were that some of the Arco Marine's expenses were paid through Atlantic Richfield, that two crew members of the Arco Alaska stated they were employees of "Arco" and "Atlantic Richfield, Long Beach, California," and that the business of the Arco Alaska consisted of transporting products on behalf of a division of Atlantic Richfield. On these facts, the court found that there was not an adequate showing of domination by the parent corporation over the subsidiary and ruled in favor of the defendants.

V. ISSUE B
HOLDING OF LIABILITY

(B) If it is assumed that the factual charges made in the Bill of Particulars filed by the Criminal Division of the Department of Justice on July 31, 1990 against Exxon Corporation and Exxon Shipping Company are true, what is the outcome in the state and the federal courts in ruling on whether Exxon Corporation is liable for the acts of Exxon Shipping Corporation employees as related to the Exxon Valdez oil spill?

The analysis of this issue involves reviewing the previously stated facts cited in the Bill of Particulars and the foregoing cases from the Alaska state courts and the federal circuits. In both the state and federal courts, Exxon Corporations should be held liable for the acts of Exxon Shipping, both on the grounds that Exxon Shipping acted as the "mere instrumentality" of Exxon Corporation and on the grounds that to not hold Exxon liable would render a great harm to a third party, namely the state of Alaska.

Using the eleven point criteria as stated in Jackson v. General Electric Co., supra, and Taylor v. Standard Gas & Electric Co., supra, the following is discovered:

1. Exxon Corporation owned all of the capital stock of Exxon Shipping.

2. Exxon Corporation and Exxon Shipping do not share directors or officers.

3. Exxon Corporation provides financing for Exxon Shipping for major and minor purchases and all purchases must be approved by Exxon officials prior to execution by Exxon Shipping.

4. Exxon Corporation caused the incorporation of Exxon Shipping and subscribes to all the capital stock.

5. Exxon Shipping has adequate capitalization for maintenance of its fleet, but is reliant on Exxon Corporation for financing of major procurements.

6. All assets maintained by Exxon Shipping were conveyed by Exxon at time of incorporation, including office space and all shipping equipment. Further, substantially all business activity recorded by Exxon Shipping is for Exxon.

7. Exxon Shipping pays the salaries and other expenses of its employees. However, Exxon regularly provides bonuses to Exxon Shipping managers.

8. Exxon regularly consolidates the activity, successes and failures of Exxon Shipping in its annual reports as though it were Exxon's.

9. Exxon represents the tanker fleet of Exxon Shipping in its annual reports as though it were Exxon's.

10. Exxon Shipping's directors must act in accordance with Exxon policy and with Exxon approval.

11. Exxon Shipping's directors cannot set policy and otherwise act without first gaining approval from Exxon officials.

12. Exxon Shipping's business decisions are affected by the business decisions of Exxon.

From this analysis, it becomes clear that Exxon Shipping could not possibly exercise an independent status as a corporation. Exxon gave birth to Exxon Shipping and provided Exxon Shipping with the capital and the assets

to function as its domestic shipping agent. Exxon provided Exxon Shipping with office space in the Exxon U.S.A. building in Houston, Texas. Exxon, as parent, regularly held out Exxon Shipping's fleet as though it were its own, especially when it proclaimed the Exxon Valdez "the largest vessel in Exxon's U.S. flag fleet." Not Exxon Shipping's fleet, but Exxon's fleet.

Exxon provides many administrative functions for Exxon Shipping, making it dependent on Exxon for the daily function of the corporation. Especially telling is the use of office space in the Exxon U.S.A. Headquarters by Exxon Shipping Co. as their headquarters. This allows Exxon U.S.A., a division of Exxon Corporation, to oversee the personnel and operations of Exxon Shipping on a daily business, allowing for a constant, everpresent control over Exxon Shipping's activities.

The fact that Exxon Shipping provided its services almost exclusively to Exxon demonstrates the function of Exxon Shipping as merely a business conduit for the management of Exxon's domestic shipping activity. Contrast this with the independent activities of General Electric Credit Corporation in Jackson v. General Electric Co., supra. There, GECC generated almost 50% of outside commercial credit activity, allowing it to have a business purpose beyond General Electric Co. Exxon Shipping, however, exists solely to transport Exxon oil from terminal to refinery.

Policy and operational decisions by the Exxon Shipping Board of Directors were required to be reviewed and approved by Exxon officials. When Exxon implemented policies throughout its corporate structure, Exxon Shipping was required to implement the same policies for its corporation, without consideration of alternatives.

While Exxon Shipping and Exxon do not share the same officers and directors, Exxon felt compelled to pay bonuses to managers for superior work without the authorization of the Exxon Shipping Board of Directors. This illustrates the lack of respect Exxon gave the Exxon Shipping Board of Directors. This lack of respect of the formal corporate form of Exxon Shipping is more evident in Exxon's reduction of the Board of Directors to one member, thus consolidating the power of Exxon over Exxon Shipping. With only one Director, Exxon could easily manipulate Exxon Shipping's activities for its use.

Finally, in analyzing the status of Exxon and Exxon Shipping, it is necessary to remember the third parties involved in the suit. The state of Alaska and the federal government have suffered potentially irrepairable damage from the Exxon Valdez oil spill. As have thousands of citizens whose livelihoods depended on fishing, recreation and other activities which came to a halt because of the spill. To limit liability solely to Exxon Shipping, and to refuse to hold Exxon liable for the damages caused by the spill, would render a great injustice to the state, the federal government, and especially the citizens. The undercapitalized nature of Exxon Shipping could not sustain the avalanche of lawsuits and would immediately file for bankruptcy. One possible scenario involves Exxon Shipping filing for bankruptcy. Exxon Corporation would become a creditor to Exxon Shipping and, being the sole shareholder in Exxon Shipping, first in rights to the assets of Exxon Shipping. It is conceivable that Exxon, as creditor, could receive as part of its settlement title to the Exxon Valdez, now the Exxon Mediterranean, and the Exxon Long Beach, as well as other assets for which Exxon Shipping owes Exxon. This would place the state of Alaska, the federal government, and the thousands of citizens who suffered from the spill in the position of secondary creditors whose debts would be satisfied only after Exxon's.

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Walcoff & Associates

TRIP REPORT

April 30 - May 3, 1990

ATTENDEES: Lynette Dennis, Project Manager
Jacquie Price, Conference Planner

DESTINATION: Seattle, Washington and Anchorage, Alaska

PURPOSE & OBJECTIVE: To survey sites and make contacts for meetings, hotel accomodations, corporate suites/apartments and food service.

SITE SURVEYS: Extensive research was conducted and contacts established in the following areas. A Resource List has been compiled that gives contact names and numbers and follows this report at Attachment A.

SEATTLE, WASHINGTON

- Hotel Accomodations - Four major hotels with adequate meeting facilities were identified. Room rates vary according to season, but government rates are available. All hotels surveyed were in the immediate downtown Seattle area. Contacts were made with all sales managers of each hotel.

- Meeting Rooms - All hotels had meeting facilities to accomodate groups of various sizes. We still await information on GSA meeting facilites. Upon notification of specific meeting dates and attendees, we can pursue reserving government agency meeting space.

- Food Service - With food service provided by hotels, rental charges for meeting rooms are waived.

ANCHORAGE, ALASKA

- Hotel Accomodations - Five major hotels were surveyed for sleeping accomodations. Seasonal rates are in effect from May 15 to September 15 with limited availability. Government rates are available.

- Corporate Suites/Apartments - Several apartments were inspected and three have been identified as meeting the location and quality requirements. Leases are available for a minimum of 6 months. Monthly rates range from $685 to $1200 for fully furnished apartments.

- Meeting Rooms - It is assumed that investigation related meetings will be held in the Simpson Building on G Street. That facility was inspected for variety of meeting room sizes, work space and food service facilities. Contact was made with CACI personnel for future coordination of meetings and investigative work by experts and DoJ staff.

- Food Service - It was apparent from the visit to the Simpson Building that there are no nearby restaurants that meeting attendees could frequent for a quick lunch or break during the work day. Therefore, two food service companies were interviewed and price estimates obtained for sample breakfasts and lunches that could be set up in the Simpson Building.

RECOMMENDATIONS/CONCLUSIONS:

- Hotel Accomodations - Accomodations in Seattle are adequate and there should be no difficulty in reserving rooms except for the last half of July when the "Goodwill Games" will be in Seattle. Hotels are already booked for that period.

  Accomodations in Anchorage will be difficult for the remainder of the summer. In addition to rates dropping dramatically after September 15, it will be possible to reserve a block of rooms at a discount should there be a probability of large meetings over the winter.

- Corporate Suites/Apartments - The assurance of having accomodations for at least a few people guaranteed justifies the expense of 6 month leases on two one-bedroom apartments near downtown Anchorage. Recommend leasing two apartments from Cordova Square as soon as possible.

- Meeting Rooms - In Seattle, use hotel meeting rooms unless there is enough lead time to reserve conference space in one of the Federal buildings.
  In Anchorage, use the Simpson Building space. In the event of a conflict or "over-booking" at the Simpson Building, several of the hotels have meeting rooms that could be reserved.

- Food Service - Meetings in the hotel rooms in Seattle would use the hotel food service for waiving the room rental. There is a wide range of food service companies in Anchorage and accomodating our needs there can be done in advance by telephone.

NOTE: Given the constraint of competing with summer tourist trade in both cities, it would be most beneficial if meeting dates could be established and reservations made. Details concerning attendees, goals of the meetings and other specifics could be "fit into" the dates and reservations made in advance.

Resource List - Department of Justice
Site Visits to Seattle and Anchorage

SEATTLE, WASHINGTON

Hotel Accomodations/Meeting Rooms:

- Four Seasons Olympic
  411 University
  (206) 621-1700
  Contact Person: Marie

- Stouffer Madison
  515 Madison Street
  (206) 583-0300
  Contact Person: Jennifer Rinker

- Sheraton Hotel
  1400 Sixth Avenue
  (206) 621-9000
  Contact Person: Eric LeDrew

- Seattle Hilton
  Sixth and University
  (206) 624-0500
  Contact Person: Val Beauchemin

ANCHORAGE, ALASKA

Hotel Accomodations:

- Captain Cook Hotel
  5th and K Street
  (907) 276-6000
  Contact Person: Mark Roetto

- Westmark Hotel
  720 W 5th Avenue
  (907) 276-7676

- Sheraton Anchorage Hotel
  401 East Sixth Avenue
  (907) 276-8700
  Contact Person: Melba

- The Anchorage Hilton
  500 West Third Avenue
  (907) 272-7411

- Anchorage Hotel
  330 E Street
  (907) 272-4553
  Contact Person: Tanya

Corporate Suites/Apartments:

- Corporate Suites - Fontainbleau
  1711 Lore Road
  (907) 344-2812

- Cordova Square
  Eleventh and Cordova
  (907) 274-6143
  Contact Person: Ruth Pease

- Park Plaza Apartments
  201 E. 16th Avenue #101
  (907) 278-3540
  Contact Person: Wolf Klein

Leasing Agent:

- Marston Properties
  Larry Gordon - Assistant Property Manager/Leasing Agent
  4105 Turnagain Blvd.
  (907) 248-1717

FOOD SERVICE:

- Progressive Catering
  (907) 344-9900
  Sheldon Lencioni/David Newirth

- Scovel's Catering Service
  (907) 277-8306
  Mark Scovell

Walcoff & Associates

May 10, 1990

Christina Gardner
Case Manager
U.S. Department of Justice
P.O. Box 685
Washington, DC 20044

SUBJECT: Trip Report
CONTRACT NO.: OC-K-LDN-0047

Dear Christina:

In accordance with subject contract requirements, Walcoff & Associates submits the enclosed trip report from our site surveys in Seattle, Washington and Anchorage, Alaska on April 30 - May 3, 1990.

Please contact me if you have any questions regarding the report. Thank you.

Sincerely,

Lynette C. Dennis

Lynette C. Dennis
Project Manager

Enclosure

TECHNICAL RESEARCH ○ MANAGEMENT CONSULTING
635 Slaters Lane, Suite 102, Alexandria, Virginia 22314
Telephone (703) 684-5588 / Facsimile (703) 548-0426

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Walcoff & Associates

May 10, 1990

Christina Gardner
Case Manager
U.S. Department of Justice
P.O. Box 685
Washington, DC 20044

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Lynette C. Dennis

Lynette C. Dennis
Project Manager

Enclosure

TECHNICAL RESEARCH o MANAGEMENT CONSULTING
635 Slaters Lane, Suite 102, Alexandria, Virginia 22314
Telephone (703) 684-5588 / Facsimile (703) 548-0426

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Citations from the
Life Sciences Collection Database

Oil Spill Removal: Dispersants, Absorbants, Booms, and Skimmers
(Mar 78 - May 89)

Linda Hall Library — 816-363-4600
5109 Cherry St.
KC MO 64110

Stewart Biggerstaff

PUBLISHED SEARCH

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
NTIS.

TITLE LIST

8. EFFECTS OF CRUDE OIL AND CHEMICAL DISPERSANT ON PHOTOSYNTHESIS IN THE BRAIN CORAL DIPLORIA STRIGOSA .

8. EFFECT OF OIL AND DISPERSANT ON GROWTH AND CHLOROPHYLL A CONTENT OF THE MARINE MICROALGA TETRASELMIS SUECICA .

8. ENHANCED OIL RECOVERY: ENVIRONMENTAL ISSUES AND STATE REGULATORY PROGRAMS.

8. EFFECTS OF HIGH PRESSURE, HOT WATER SHORE CLEANING AFTER OIL SPILLS ON SHORE ECOSYSTEMS IN THE NORTHERN BALTIC PROPER.

9. FIELD EXPERIMENTS ON THE EFFECTS OF CRUDE OIL AND DISPERSANT ON THE COMMON ANIMAL AND PLANTS OF ROCKY SEA SHORES.

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10. THE INFLUENCE OF AN OIL DISPERSANT CHEMSERVE OSE-DH ON THE VIABILITY OF SEA URCHI GAMETES, COMBINED EFFECTS OF TEMPERATURE, CONCENTRATION AND EXPOSURE TIME ON FERTILIZATION.

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11. OIL SPILL CLEANUP FULFILLS AIM OF FEDERAL WATER POLLUTION CONTROL ACT.

11. CORRELATION OF DISPERSANT EFFECTIVENESS AND TOXICITY OF OIL DISPERSANTS TOWARDS THE ALGA CHLAMYDOMONAS REINHARDTI .

12. EFFECTS OF A CHEMICAL DISPERSANT AND CRUDE OIL ON BREEDING DUCKS.

12. EFFECT OF OIL AND OIL DISPERSANT MIXTURES ON THE BASAL METABOLIC RATE OF DUCKS.

12. EFFECT OF IXTOC 1 CRUDE OIL AND COREXIT 9527 DISPERSANT ON SPOT (LEIOSTOMUS XANTHURUS) EGG MORTALITY.

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13. SLICK MOVERS.

13. EFFECTS OF A CHEMICAL DISPERSANT AND CRUDE OIL ON BREEDING DUCKS.

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13. LONG-TERM CONSEQUENCES OF OIL SPILLAGE AND COASTAL SENSITIVITY.

14. THE EFFECTS OF OIL, DISPERSANT, AND EMULSIONS ON THE SURVIVAL AND BEHAVIOR OF AN ESTUARINE TELEOST AND AN INTERTIDAL AMPHIPOD.

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14. METABOLISM OF COMPLEX MIXTURES OF OIL SPILL SURFACTANT COMPOUNDS BY A REPRESENTATIVE TELEOST (SALMO GAIRDNERI), CRUSTACEAN (CANCER IRRORATUS), AND MOLLUSC (CHLAMYS ISLANDICUS).

14. DEVELOPMENTS IN INDUSTRIAL MICROBIOLOGY.

15. LETHAL AND SUBLETHAL EFFECTS OF SHORT TERM ACUTE DOSES OF KUWAIT CRUDE OIL AND A DISPERSANT COREXIT 9527 ON BAY SCALLOPS AGROPECTEN IRRADIANS (LAMARCK) AND TWO PREDATORS AT DIFFERENT TEMPERATURES.

15. EFFECTS IN CULTURE OF TWO CRUDE OILS AND ONE OIL DISPERSANT ON ZYGOTES AND GERMLINGS OF FUCUS SERRATUS LINNAEUS (FUCALES, PHAEOPHYCEAE).

15. INFORMATION FROM OIL AND GAS INDUSTRY ESSENTIAL TO PROTECT COASTAL ENVIRONMENT FROM OILWELL SPILLS.

16. DIFFERENCES IN THE TOXICITIES OF AN OIL DISPERSANT AND A SURFACE ACTIVE AGENT TO SOME MARINE ANIMALS AND THEIR IMPLICATIONS IN THE CHOICE OF SPECIES IN TOXICITY TESTING.

16. TOXICITY TESTING OF OIL SLICK DISPERSANTS IN HONG KONG.

16. THE 'SLICKTRAIL' DESIGN, A COMBINATION OF A TRAILING SUCTION HOPPER DREDGER AND A OIL RECOVERY VESSEL. /(PRESENTED AT: INTERMARITEC '80, HAMBURG, INTERNATIONAL CONFERENCE ON MARINE SCIENCES AND OCEAN ENGINEERING; HAMBURG (GFR); 1980).

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17. TENSILE STRENGTH AND ELASTICITY OF OFFSHORE OIL BOOMS. /(PRESENTED AT: INTERMARITEC '80, HAMBURG, INTERNATIONAL CONFERENCE ON MARINE SCIENCES AND OCEAN ENGINEERING; HAMBURG (GFR); 1980).

17. FOAM PLASTICS FOR CONTROL OF AN ACCIDENTAL OIL SPILL.

18. DEVELOPMENT OF A NEW DEVICE TO COMBAT OIL SPILLS AT SEA.

18. RELATIONSHIP BETWEEN OIL POLLUTION AND PSAMMOLITTORAL MEIOFAUNA DENSITY OF TWO SOUTH AFRICAN BEACHES.

18. COLLECTIVE PREVENTION AND CONTROL OF POLLUTION BY OIL: LAKE MARACAIBO, VENEZUELA. /(PRESENTED AT: 10. WORLD PETROLEUM CONGRESS; BUKAREST (HUNGARY); 1979).

19. OPEN SEA OIL CLEAN-UP AT IXTOC-1 CAMPECHE BAY, MEXICO. /(PRESENTED AT: INTERMARITEC '80, HAMBURG, INTERNATIONAL CONFERENCE ON MARINE SCIENCES AND OCEAN ENGINEERING; HAMBURG (GFR); 1980).

19. MECHANICALLY OPERATING OIL SKIMMING AND DISPOSAL SYSTEM FOR THE HIGH SEA.

19. SUCCESSFUL SEA TRIALS FOR COLLECTOR.

19. NEW SKIMMER INTRODUCED BY VIKOMA.

20. US/FRENCH COMPARE OIL SPILL TOOLS.

20. TEXAS, 1979-EXPERIENCE WITH MARCO FILTERBELT SKIMMERS ON IXTOC 1 AND BURMAH AGAT CRUDE OIL SPILLS. /(PRESENTED AT: OCEANS '80; SEATTLE, WA (USA); 8 SEP 1980).

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20. AN EXPERIMENTAL EVALUATION OF OIL SPILL COMBUSTION PROMOTERS. /(PRESENTED AT OCEANS '80; SEATTLE, WA (USA); 8 SEP 1980).

21. FEASIBILITY OF WATER SPRAY BARRIERS AS FIREPROOF OIL SLICK CONTAINMENT DEVICES. /(PRESENTED AT: OCEANS '80; SEATTLE, WA (USA); 8 SEP 1980).

21. FISHING HARBOR WASTES AND WHAT CAN BE DONE ABOUT THE PROBLEMS. CONFERENCE ON SEAFOOD WASTE MANAGEMENT IN THE 1980'S; ORLANDO, FL (USA); 23 SEP 1980.

21. U.S. COAST GUARD FAST CURRENT OIL RECOVERY SYSTEM DEVELOPMENT. PRESENTED AT: 16. ANNU. CONF. OF THE MARINE TECHNOLOGY SOCIETY; WASHINGTON, DC (USA); 6 OCT 198 .

21. CHEMICAL TREATMENT OF OIL SPILLS.

22. MINIMIZING THE ECOLOGICAL IMPACTS OF OIL SPILLS.

22. ARTIFICIAL LIFT CONCEPTS AND TIMING.

22. NORTH SEA OPERATORS FACE VARIED PROBLEMS.

22. OWNERS FIGHT POLLUTION.

23. PERFORMANCE OF SOME OIL DISPERSANTS ON OIL SLICKS OF VARYING THICKNESS.

23. CLEAN-UP OF OIL POLLUTION AT SEA. /(PRESENTED AT: EUROPEC '80; EUROPEAN OFFSHORE PETROLEUM CONFERENCE AND EXHIBITION; LONDON (UK); 21 OCT 1980).

23. CATALOGUE OF FRENCH MEANS OF COMBATTING OIL SPILLS AT SEA.

23. (CLEANING SURFACE WATERS).

23. COMPUTER MODEL WILL AID OIL SPILL CLEANUP EFFORTS.

24. ANNOUNCING A BOOM IN OIL RECOVERY.

24. SAVING OIL TO SALVE CONSCIENCE.

24. OPERATING EXPERIENCE WITH COAST GUARD POLLUTION EQUIPMENT [XIOC]. // (PRESENTED AT: 16. ANNU. CONF. OF THE MARINE TECHNOLOGY SOCIETY; WASHINGTON, DC (USA); 6 OCT 1980).

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24. INTERDISCIPLINARY PANEL STATEMENTS. ENGINEERING INTERACTIONS. // (PRESENTED AT INTERNATIONAL WORKSHOP ON THE SEASONAL SEA ICE ZONE; MONTEREY, CA (USA); 26 FEB 1979).

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25. STRETCHING THE CAPACITY OF COMPUTER MODELLING.

25. OIL SPILL CLEANUP AND CONTAINMENT. // (PRESENTED AT: SYMPOSIUM; WASHINGTON, D (USA); 6 DEC 1979).

25. REHABILITATION OF BIRDS OILED ON TWO MID-ATLANTIC ESTUARIES. // (PRESENTED AT: 32. ANNUAL CONFERENCE SOUTHEASTERN ASSOCIATION OF FISH AND WILDLIFE AGENCIES; HOT SPRINGS, VA (USA); 5 NOV 1978).

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26. AN OILSPILL IN PACK ICE.

26. (PHYTOCOENOLOGICAL SURVEY OF THE AMOCO CADIZ OIL SPILL EFFECTS ON THE SALT MARSHES OF THE NORTHERN COAST OF BRITTANY).

27. DIFFERENCES IN THE EFFECTS OF FUEL OIL, AN OIL DISPERSANT AND THREE POLYCHLORINATED BIPHENYLS ON FIN REGENERATION IN THE GULF COAST KILLIFISH, FUNDULUS GRANDIS .

27. CHANGES IN THE RESPIRATION AND BLOOD CIRCULATION OF COD, GADUS MORHUA L., INDUCED BY EXPOSURE TO POLLUTANTS.

27. OIL-SPILL CHEMICALS, A BIBLIOGRAPHY ON THE NATURE, APPLICATION, EFFECTS AND TESTING OF CHEMICALS USED AGAINST OIL SPILLED IN THE MARINE ENVIRONMENT.

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27. (OIL SKIMMERS).

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28. STATE OF THE ART IN HIGH SEA-STATE OIL POLLUTION RESPONSE CAPABILITIES.

28. CHEMICAL CHARACTERISTICS OF SOME INDIGENOUSLY MANUFACTURED OIL DISPERSANTS.

28. CONTROL OF OIL SLICKS IN FLOWING WATER USING AIR BUBBLE BARRIERS.

28. OIL POLLUTION AND PENGUINS _ IS CLEANING JUSTIFIED?

29. OIL, OIL DISPERSANTS AND RELATED SUBSTANCES IN THE MARINE ENVIRONMENT.

29. RESEARCH INTO TOXICITY EVALUATION AND CONTROL CRITERIA OF OIL DISPERSANTS.

29. MANUAL OF PRACTICE FOR PROTECTION AND CLEANUP OF SHORELINES. VOLUME 1: DECISION GUIDE.

29. MANUAL OF PRACTICE FOR PROTECTION AND CLEANUP OF SHORELINES. VOLUME 2: IMPLEMENTATION GUIDE.

30. THE IMPACT OF OIL AND GAS PRODUCTION FROM THE MARINE ENVIRONMENT: AN ANALYSIS OF THE RECORD. PRESENTED AT: MARINE SCIENCES AND OCEAN POLICY SYMPOSIUM; SANTA BARBARA, CA (USA); JUN 1979.

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31. INVESTIGATION OF THE EFFECTS OF OIL VISCOSITY AND WATER-IN-OIL EMULSION FORMATION ON DISPERSANT EFFICIENCY.

31. DISPERSANT GELS FOR TREATING SURFACES CONTAMINATED WITH RESIDUAL OILS.

31. CHANGES IN THE ULTRASTRUCTURE OF THE GILL EPITHELIUM OF PATELLA VULGATA AFTER EXPOSURE TO NORTH SEA CRUDE OIL AND DISPERSANTS.

32. MITIGATING OIL SPILL DAMAGE - ECOLOGICALLY RESPONSIBLE CLEAN-UP TECHNIQUES. PRESENTED AT: THE MITIGATION SYMPOSIUM: A NATIONAL WORKSHOP ON MITIGATING LOSSES OF FISH AND WILDLIFE HABITATS; FORT COLLINS, CO (USA); 16 JUL 1979.

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32. OIL REMOVAL FROM WATER SURFACE WITH OKITEN, EKOPERL 33 OR EKOPERL 66.

32. OIL SPILL CLEANUP ACTIVITIES.

33. THE IMPACT OF CRUDE OIL AND OIL DISPERSANTS ON THE MARINE OLIGOCHAETE MARIANINA SUBTERRANEA .

33. REMOVAL OF GREASE AND OIL BY BIOLOGICAL TREATMENT PROCESSES.

33. COLD OIL SALVAGE PUMPS.

33. UNITED KINGDOM GOVERNMENT ORGANISATION FOR MARINE POLLUTION CONTROL.

34. COMBATING OIL SPILLS IN THE MARINE ENVIRONMENT.

34. FUNDAMENTAL STUDIES ON THE INFLUENCE OF OIL POLLUTION UPON MARINE ORGANISMS. IV. THE TOXICITY OF MIXTURES OF OIL PRODUCTS AND OIL-SPILL EMULSIFIERS TO PHYTOPLANKTON.

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34. THE CONTAINMENT OF AN OIL SLICK BY A BOOM PLACED ACROSS A UNIFORM STREAM.

35. ACOUSTIC POSITIONING USED SUCCESSFULLY IN IXTOC 1 BLOWOUT RESPONSE.

35. THE APPLICATION OF WASTE SYNTHETIC FIBRES TO REMOVE OIL SPILLS FROM WATER SURFACES.

35. DISPERSANTS FOR OIL SPILL CLEAN-UP OPERATIONS AT SEA, ON COASTAL WATERS AND BEACHES.

35. OIL MOP DEVICE FOR RECOVERY OF OIL ON THE OPEN SEA.

36. CLEARANCE OF OIL FROM WATER SURFACES: THE OIL MOP RECOVERY DEVICE.

36. EVALUATION TRIALS ON EQUIPMENT MANUFACTURED BY O.M.I. LTD., TONBRIDGE, KENT. THE OIL MOP MARK II-9DP.

36. REPORT ON O.R.I. OIL RECOVERY EQUIPMENT, THE BARRACUDA AND PIRANHA MACHINES MANUFACTURED BY OIL RECOVERY INTERNATIONAL, CHRISTCHURCH, DORSET.

36. CRITERIA FOR THE SELECTION OF OIL SPILL CONTAINMENT AND RECOVERY EQUIPMENT FOR US AT SEA.

37. PROTECTION, CLEANUP AND RESTORATION OF SALT MARSHES ENDANGERED BY OIL SPILLS: A PROCEDURAL MANUAL.

37. POLLUTION FEATURE: SLOWLY GETTING MATTERS RIGHT.

37. INTERACTION BETWEEN POLYCYCLIC AROMATIC HYDROCARBONS, CRUDE OIL AND OIL DISPERSANTS IN THE SALMONELLA MUTAGENESIS ASSAY.

38. COMBINED DREDGER

38. EFFECTS OF THREE OIL SPILL DISPERSANTS ON MARINE BACTERIAL POPULATIONS. 1. PRELIMINARY STUDY. QUANTITATIVE EVOLUTION OF AEROBES.

38. ASSESSMENT OF THE ACUTE AND SUB-LETHAL EFFECTS OF VARIOUS POLLUTANTS ON SELECTED MARINE ORGANISMS AND THE FATE OF PETROLEUM HYDROCARBONS IN AN ESTUARY SUBJECTED T A REFINERY EFFLUENT.

38. DISTRIBUTION OF HYDROCARBONS AMONG OIL, WATER AND VAPOR PHASES DURING OIL

DISPERSANT TOXICITY TESTS.

39. CYCLIC FLUCTUATIONS IN POPULATION DENSITY DURING ELEVEN YEARS RECOLONISATION OF ROCKY SHORES IN WEST CORNWALL FOLLOWING THE TORREY CANYON OIL-SPILL IN 1967.

39. BOOMS USED FOR OIL SLICK CONTROL.

39. EFFECTS OF COREXIT 9527 ON THE HATCHABILITY OF MALLARD EGGS.

39. AERIAL APPLICATION OF DISPERSANTS IN BANTRY BAY FOLLOWING THE BETELGEUSE INCIDENT.

40. THE EFFECTS OF OIL DISPERSANTS ON MARINE EGGS AND LARVAE.

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40. EFFECTS OF INSECTICIDES, OIL DISPERSANTS AND SYNTHETIC DETERGENT ON THE EMBRYONIC DEVELOPMENT IN MEDAKA, ORYZIAS LATIPES .

41. THE EFFECTS OF BUNKER C OIL AND AN OIL DISPERSANT: PART 2 - EFFECTS ON THE ACCUMULATION OF CHLORINE-LABELLED BUNKER C OIL IN VARIOUS FISH TISSUES.

41. BANTRY BAY SKIMMER.

41. NEW PROCEDURES FOR THE TOXICITY TESTING OF OIL SLICK DISPERSANTS IN THE UNITED KINGDOM.

41. THE SEA URCHIN EGG AS A TEST OBJECT IN OIL POLLUTION STUDIES.

42. EFFECTS OF INSECTICIDES, OIL DISPERSANTS AND SYNTHETIC DETERGENT ON THE EMBRYONIC DEVELOPMENT IN MEDAKA, ORYZIAS LATIPES .

42. SOME EFFECTS OF EMULSIFIERS AND OIL ON TWO COPEPOD SPECIES.

42. EFFECTS OF INSECTICIDES, OIL DISPERSANTS AND SYNTHETIC DETERGENT ON THE EMBRYONIC DEVELOPMENT IN MEDAKA, ORYZIAS LATIPES .

43. THE ACUTE EFFECT OF BUNKER C OIL AND AN OIL DISPERSANT ON: 1 SERUM GLUCOSE, SERUM SODIUM AND GILL MORPHOLOGY IN BOTH FRESHWATER AND SEAWATER ACCLIMATED RAINBOW TROUT (SALMO GAIRDNERI).

43. TOXICITY TESTING WITH SYNCHRONIZED CULTURES OF THE GREEN ALGA CHLAMYDOMONAS .

43. ACUTE TOXICITY OF SEVERAL OIL DISPERSANTS TOWARDS THE GREEN ALGAE CHLAMYDOMONAS AND DUNALIELLA .

43. THE EFFECTS OF CRUDE OIL AND THE DISPERSANT, OILSPERSE 43, ON RESPIRATION AND COUGHING RATES IN ATLANTIC SALMON (SALMO SALAR).

44. OIL SPILL DISPERSANTS CAUSE BRADYCARDIA IN A MARINE FISH.

44. THE CLEAN-UP OF OIL SPILLS FROM UNPROTECTED WATERS.

44. EFFECTS OF CRUDE OILS AND THE OIL DISPERSANT COREXIT ON PRIMARY PRODUCTION OF ARCTIC MARINE PHYTOPLANKTON AND SEAWEED.

45. SOIL RESTORATION FOLLOWING OIL SPILLS - A REVIEW.

45. OIL-WATER SEPARATION AND THE IMCO PERFORMANCE TEST SPECIFICATION FOR SEPARATORS.

45. OIL SPILL PREVENTION AND RECOVERY.

45. CHARACTERISTICS OF SUSPENSIONS OF KUWAIT OIL AND COREXIT 7664 AND THEIR SHORT- AN LONG-TERM EFFECTS ON TISBE BULBISETOSA (COPEPODA: HARPACTICOIDA).

46. WEAPONS AGAINST OIL POLLUTION.

CITATIONS

EFFECTS OF SHORT-TERM EXPOSURE TO DISPERSED OIL IN ARCTIC INVERTEBRATES. - 1951770

Mageau, C. Engelhardt, F. R. Gilfillan, E. S. Boehm, P. D.

ARCTIC., vol. 40, no. suppl. 1, pp. 162-171 LANGUAGE(S)- ENGLISH PUBL. DATE- 1987. TYPE- JOURNAL ARTICLE NOTES- Special issue: Baffin Island Oil Spill (BIOS) Project. TAPE ISS- 0589 NDN- 032-0113-0565-0

A series of experimental studies was carried out as part of the Baffin Island Oil Spill (BIOS) Project to define the behavioural, physiological and biochemical reactions of three arctic marine invertebrate species exposed to chemically disperse crude oil. Behavioural responses and patterns of hydrocarbon accumulation and releas observed in the bivalves and the urchin during the 1981 field spill were similar t those observed during the laboratory simulations. Ostial closure, loss of responsiveness to mechanical stimuli and narcosis were characteristic of the bivalves. Exposed urchins displayed a functional loss of tube foot and spine behaviour. Detailed hydrocarbon analysis indicated different uptake dynamics among the species. The effects of dispersed oil were immediate and short lived and resulte in temporary accumulation of hydrocarbons.

THE MUTAGENIC EFFECT OF FIVE OIL DISPERSANTS AND OF ETHYLENEGLYCOL-MONOBUTYLETHER IN BACTERIOPHAGE T4D. - 1850308

Kvelland, I.

HEREDITAS, vol. 109, no. 1, pp. 149-150 LANGUAGE(S)- ENGLISH PUBL. DATE- 1988 TYPE- JOURNAL ARTICLE TAPE ISS- 1288 COMPANY RELATED- Zool. Lab., Univ. Bergen, Allegt. 41, N-5007 Bergen, Norway NDN- 032-0113-4410-4

The toxic and mutagenic effects of several oil dispersants have been investigated in bacteriophage T4D. Most of the oil dispersants employed had a severe toxic effect on phage yield. One dispersant, Corexit 9527, also had a mutagenic effect when it was tested after being kept in a dark cold store room. This mutagenicity was lost when the oil dispersant was kept in cool white light and at room temperature for several months. In the present investigation a number of other oil dispersants have been studied for mutagenicity and toxicity in bacteriophage T4D.

THE ACUTE TOXICITY OF THREE OIL DISPERSANTS. - 1584924

Oyewo, E. O.

ENVIRON. POLLUT., SER. A, vol. 41, no. 1, pp. 23-31 LANGUAGE(S)- ENGLISH PUBL DATE- 1986. TYPE- JOURNAL ARTICLE TAPE ISS- 1087 COMPANY RELATED- Nigerian Inst. Oceanogr. and Mar. Res. (NIOMR), Victoria Island, PMB 12729, Lagos, Nigeria NDN- 032-0101-7411-2

Static bioassay tests were conducted with three oil dispersants at two salinities (32.0 plus or minus 2 g litre super(-1) and 16.0 plus or minus 1 g litre super(-1)) using fingerlings of the mullet Mugil sp. and hermit crabs Clibinarius africanus a test animals. The acute toxicity was estimated both by graphical interpolation and the approximate nomographic method of Litchfield & Wilcoxon and is reported as the 2 h, 48 h and 96 h LC (1) sub(50) values. Conco-K was the most toxic, and BP 1,100X th least toxic, to the two test organisms at the two test salinities. Simple observations were made on the behavioural responses of the test animals. The role of acute toxicity data in ecological predictions is briefly discussed.

COMBINED TOXICITY OF FOUR TOXICANTS (CU, CR, OIL, OIL DISPERSANT) TO ARTEMIA SALINA . - 1561355

Verriopoulos, G. Moraitou-Apostolopoulou, M. Milliou, E.

BULL. ENVIRON. CONTAM. TOXICOL., vol. 38, no. 3, pp. 483-490 LANGUAGE(S)- ENGLISH PUBL. DATE- 1987. TYPE- JOURNAL ARTICLE TAPE ISS- 0987 COMPANY RELATED- Zool. Lab., Univ. Athens, 157 71 Athens, Greece NDN- 032-0101-0932-6

For a realistic approach to pollution effects it is essential to estimate the combined toxicity of two or more chemicals. There is a need to understand the mechanisms and quantify the effects of multiple toxicity in order to provide responsible authorities with rational estimate of the effects of chemical mixtures. Thus the potential toxic effects of mixtures of toxicants has recently become a subject of growing scientific interest. In this paper the authors have tried to estimate the joint toxicity of some pollutants commonly found in nearshore polluted

waters; two metals, copper and chromium; an oil (Tunisian crude oil zarzaitine type) and oil dispersant (Finasol OSR-2).

OIL SPILL CLEAN-UP: THE EFFECT OF THREE DISPERSANTS ON THREE SUBTROPICAL/TROPICAL SEAGRASSES. - 1524451

Thorhaug, A. Marcus, J.

MAR. POLLUT. BULL., vol. 18, no. 3, pp. 124-126 LANGUAGE(S)- ENGLISH PUBL. DATE- 1987. TYPE- JOURNAL ARTICLE TAPE ISS- 0687 COMPANY RELATED- Florida International Univ., Tamiami Campus, Miami, FL 33199, USA NDN- 032-0098-2431-3

Three seagrasses found throughout the Greater Caribbean tropical/subtropical region as major critical habitat organisms were tested in the laboratory for toxicity limit to three dispersants commonly stockpiled in the region. At concentrations in the recommended dosage level, that is, below 1 ml dispersant with 10 ml oil in 100,000 m seawater, even for 100 h no large mortality occurred. At an order of magnitude higher, especially for longer time periods, the more sensitive seagrasses Syringodium filiforme and then Halodule wrightii succumbed. The dispersants had widely differing effects, with Corexit 9527 and Arcochem D609 having far less toxic effect than Conco K(K) at the same exposure time and concentration. There was comparatively little difference between effects of oils (Louisiana crude versus Murban). Types and brands of dispersants should be referred to specifically in oil spill contingency plans since such widely varying ecological toxicity occurs among various dispersants. Use of the word 'dispersant' as a policy tool should be used with caution, realizing that dispersants vary widely in toxicity effects.

EFFECTS OF SOUTH LOUISIANA CRUDE OIL AND DISPERSANTS ON RHIZOPHORA MANGROVES. - 152456

Teas, H. J. Duerr, E. O. Wilcox, J. R.

MAR. POLLUT. BULL., vol. 18, no. 3, pp. 122-124 LANGUAGE(S)- ENGLISH PUBL. DATE- 1987. TYPE- JOURNAL ARTICLE TAPE ISS- 0687 COMPANY RELATED- Biol. Dep., Univ. Miami, Coral Gables, FL 33124, USA NDN- 032-0098-2323-0

Sprays of seawater or dispersant were found to have no value in saving oiled Rhizophora mangroves. However, mangroves treated with dispersed oil showed no greater mortality than was found in untreated control plots. It is concluded that every effort should be made to protect mangroves from oil, including offshore dispersal.

ESTIMATING AND QUANTIFYING OIL CONTAMINATION ON THE SHORELINE. - 1524712

Owens, E. H.

MAR. POLLUT. BULL., vol. 18, no. 3, pp. 110-118 LANGUAGE(S)- ENGLISH PUBL. DATE- 1987. TYPE- JOURNAL ARTICLE TAPE ISS- 0687 COMPANY RELATED- Beak Consj. Serv. Ltd., 340 Stoneywood Rd., Dyce, Aberdeen AB2 9JX, UK NDN- 032-0098-2222-5

A wide range of parameters can be used to describe the degree of oil contamination on the shoreline following a spill. This study compares five parameters, obtained by visual estimates and systematic ground mapping on a gravel beach at an experimental spill site. For shoreline cleanup decisions the most relevant parameters involves the measurement of the area of surface oil cover and calculation of the volume of contaminated sediments. Accurate estimates of the volume of oil on the shore require sampling and measurements of the concentrations of oil in the sediments. The reliability of aerial or ground estimates of the oil distribution on a gravel beach decreases with time as the colour of the surface oil changes to blend with the local sediments.

LAND AND ITS USES -- ACTUAL AND POTENTIAL: AN ENVIRONMENTAL APPRAISAL. - 1436930

Last, F. T. Hotz, M. C. B. Bell, B. G. (eds.)

NATO CONF. SER. 1, ECOL., vol. 10 LANGUAGE(S)- ENGLISH PUBL. DATE- 1986. TYPE- BOOK CONF.NAME- NATO Seminar on Land and its Uses -- Actual and Potential: An Environmental Appraisal CONF.PLACE- Edinburgh (UK) CONF.DATE- 19 Sep-1 Oct 1982 ISBN- ISBN 0-306-42214-X TAPE ISS- 0287 COMPANY RELATED- Cent. Oceanol. Bretagne, BP 337, 29273 Brest Cedex, France NDN- 032-0095-4580-1

Following large ocean oil spills the clean-up coordinators urgently require certain basic information about the surface area of the slick, and if possible the areas of the thin and thick films, and an estimate of the amount of oil in the slick particularly in the thick area so as to be able to map the slick and its characteristics. The only means of getting such information early enough to be used effectively seems to be by remote sensing, coupled with automated data treatment and

analysis. This can be done using a single-channel thermal infra-red scanning radiometer at wavelengths between 8 and 14 mu .

MICROBIAL RESPONSE TO CRUDE OIL AND COREXIT 9527: SEAFLUXES ENCLOSURE STUDY. - 1440760

Lee, K. Wong, C. S. Cretney, W. J. Whitney, F. A. Parsons, T. R. Latti, C. M. Wu, J.

MICROB. ECOL., vol. 11, no. 4, pp. 337-351 LANGUAGE(S)- ENGLISH PUBL. DATE- 1985. TYPE- JOURNAL ARTICLE TAPE ISS- 0287 COMPANY RELATED- Atl. Oceanogr. Lab., Bedford Inst. Oceanogr., Dartmouth, N.S. B2Y 4A2, Canada NDN- 032-0095-1752-0

The response of marine bacteria to Corexit 9527, with and without Prudhoe Bay crude oil labeled with n - (1 - super(14)C)hexadecane, in a temperate pelagic environment was monitored over 22 days using controlled ecosystem enclosures. The results indicated that Corexit and Corexit-dispersed crude oil stimulated bacterial production by serving as substrates and/or by inducing the release of organic compounds from the indigenous phytoplankton population. Highest bacterial standing stock was observed in the enclosure treated with a mixture of Corexit and crude oil, in which a large fraction of the predominant bacterivores were eliminated. Biodegradation appeared to be more significant than abiotic processes in contributin to the loss of low volatility n-alkanes in Corexit-dispersed oil.

AN INVESTIGATION OF THE MUTAGENIC EFFECT IN BACTERIOPHAGE T4D OF NINE OIL DISPERSANTS 1425480

Kvellend, I.

HEREDITAS, vol. 104, no. 2, pp. 317-320 LANGUAGE(S)- ENGLISH PUBL. DATE- 1986 TYPE- JOURNAL ARTICLE TAPE ISS- 0187 COMPANY RELATED- Zool. Lab., Univ. Bergen, Allegt. 41, N-5000 Bergen, Norway NDN- 032-0094-3466-3

The toxic effects of oil dispersants have been investigated in many different test organisms. In the present investigation induction of rapid lysis mutants in bacteriophage T4D was used as a tool for measuring any possible mutagenic effect of Corexit 9527, Corexit 9550, Finasol OSR-4, OSR-5, OSR-7, BP1100, OSD 41, Dispolen 34 and Hexol 6141 in this organism.

THE EFFECTS OF CRUDE OIL AND COREXIT 9527 ON MARINE PHYTOPLANKTON IN AN EXPERIMENTAL ENCLOSURE. - 1328972

Harrison, P. J. Cochlan, W. P. Acreman, J. C. Parsons, T. R. Thompson, P. A. Dovey, H. M. Chen, Y.-L.

MAR. ENVIRON. RES., vol. 18, no. 2, pp. 93-109 LANGUAGE(S)- ENGLISH PUBL. DATE 1986. TYPE- JOURNAL ARTICLE TAPE ISS- 0986 COMPANY RELATED- Dep. Oceanogr. Univ. British Columbia, Vancouver, B.C. V6T 2B1, Canada NDN- 032-0090-7352-6

The effects of a dispersant, Corexit 9527, plus Prudhoe Bay crude oil and the effect of the dispersant only on natural assemblages of marine phytoplankton in three large experimental ecosystem enclosures (LEEs) were studied. The oil and dispersant were added to a layer between 2 and 4m depth yielding initial concentrations of 4 multiplied by 5 and 2 multiplied by 0 mg litre super(-1), respectively. The enclosures remained undisturbed for the 17-day experiment except for sampling at 2- or 3-day intervals. Nutrient concentrations, nitrogen transport rates, chlorophyll a, primary productivity, phytoplankton sinking rates, species composition and cell numbers were followed over the course of the experiment.

ECOTOXICOLOGICAL TESTING FOR THE MARINE ENVIRONMENT. VOL. 2. - 1335863

Persoone, G. Jaspers, E. Claus, C. (eds.)

MAR. TOX., pp. 3-12 LANGUAGE(S)- ENGLISH PUBL. DATE- 1984. TYPE- BOOK CONF. NAME- International Symposium on Ecotoxicological Testing for the Marine Environment CONF. PLACE- Ghent (Belgium) CONF. DATE- 12-14 Sep 1983 ISSN- ISS 90-9000814-4 ISBN- ISBN 90-9000813-6 TAPE ISS- 0986 COMPANY RELATED- Dept. Zool., Univ. Goeteborg, Box 25059 S-400 31, Gothenburg, Sweden NDN- 032-0090-4774-6

A pilot study is reported in which the ability to detect and avoid a contaminated substratum has been tested on the dorvilleid polychaetes Ophryotrocha labronica, O. diadema, and a not yet described Dorvillea species. A sloppy agar gel moulded in petri dishes provided a transparent substratum. Half of each dish was filled with a contaminated gel, the other half with an uncontaminated one. The oil dispersant BP 1100 WD was used as the toxicant in the test series. All three polychaetes were able to detect and avoid the contaminated substratum at concentrations markedly inferior to the 96 h LC50 concentrations. The same sloppy agar gel also proved useful in

response such as dissolved oxygen concentration, pH, salinity, and temperature w specified. With this procedure, any bioassay is considered valid if the 48 hr LC sub(50) for SDS, used as an internal toxic control, falls within 2.3 to 4.8 ppm. Toxicity ranking of six commercial products were repeatedly duplicated with this method.

THE EFFECTS OF DIESEL OIL AND OIL DISPERSANTS ON GROWTH, PHOTOSYNTHESIS, AND RESPIR OF CHLORELLA SALINA . - 1191031

Chan, K.-Y. Chiu, S.-Y.

ARCH. ENVIRON. CONTAM. TOXICOL., vol. 14, no. 3, pp. 325-331 LANGUAGE(S)- ENG PUBL. DATE- 1985. TYPE- JOURNAL ARTICLE TAPE ISS- 0686 COMPANY RELATED Res. Lab. Food Protein Prod., Dep. Biol., Chinese Univ. Hong Kong, Shatin, N.T., Kong NDN- 032-0088-6790-0

Low concentrations of BP light diesel (0.05%) and the oil dispersant BP1100X (0.005%), either alone or in mixture, stimulated the growth rate, biomass yield, chlorophyll a level and photosynthesis of the estuarine green alga Chlorella sal CU-1, while the same concentrations slightly inhibited algal respiration. The increase in the level of chlorophyll a may be one of the factors leading to elev photosynthesis. BP light diesel and BP1100X at higher concentrations, as well as oil dispersants BP1100WD and Shell Oil Herder at all the tested concentrations, reduced growth, chlorophyll a level, photosynthesis, and respiration of the alga cells. The inhibitory action of BP light diesel and the oil dispersants was concentration-dependent. Although both algal photosynthesis and respiration were reduced by BP light diesel and the oil dispersants, the effect on respiration wa less severe when compared with that on photosynthesis. Shell Oil Herder, either or in combination with BP light diesel, were most toxic among the three oil dispersants tested.

EFFECTS OF PRE-EXPOSURE ON THE TOLERANCE OF ARTEMIA SALINIA TO OIL AND OIL DISPERS - 1192448

Moraitou-Apostolopoulou, M. Verriopoulos, G. Karakassis, I.

MAR. POLLUT. BULL., vol. 17, no. 2, pp. 72-75 LANGUAGE(S)- ENGLISH PUBL. D 1986. TYPE- JOURNAL ARTICLE TAPE ISS- 0686 COMPANY RELATED- Zool. Lab. Univ. Athens, Athens 157 71, Greece NDN- 032-0088-5969-1

Higher tolerance (acclimation phenomena, adaptation) to oil (Tunisian crude oil) oil dispersant (Finasol OSR 2, Finasol OSR 5), can be induced in Artemia salina after pre-exposure to these toxicants. The higher tolerance includes acute toxic (LC sub(50)) and sub-lethal physiological dysfunctions (respiration). High pre-exposure concentrations lead to rapid induction of acclimation phenomena but higher resistance is partly lost after exposure of the acclimated animals to cle sea water.

AN EXPERIMENTAL MARINE ECOSYSTEM RESPONSE TO CRUDE OIL AND COREXIT 9527: PART 2. BIOLOGICAL EFFECTS. - 1164418

Parsons, T. R. Harrison, P. J. Acreman, J. C. Dovey, H. M. Thompson, P. A. Lalli, C. M. Lee, M. Li, G.-G. Chen, X.-L.

MAR. ENVIRON. RES., vol. 13, no. 4, pp. 265-275 LANGUAGE(S)- ENGLISH PUBL. DATE- 1984. TYPE- JOURNAL ARTICLE TAPE ISS- 0586 COMPANY RELATED- Dep. Oceanogr., Univ. British Columbia, Vancouver, B.C., Canada NDN- 032-0087-7026

Three experimental ecosystems were employed to test the effect of Corexit 9527, w and without Prudhoe Bay crude oil, on the ecology of a temperate pelagic ecosyste The results indicated that Corexit 9527 alone enhanced biological productivity without changing the structure of the ecosystem. The mixture of Corexit and crud caused a major change in the ecology of the ecosystem which resulted in large nu of bacteria and zooflagellates, but a depression of all other zooplankton phyla.

GENOTOXICITY ASSAY OF OIL DISPERSANTS IN BACTERIA (MUTATION, DIFFERENTIAL LETHALITY DNA-REPAIR) AND YEAST (MITOTIC CROSSING-OVER). - 1152200

De Flora, S. De Renzi, G. P. Camoirano, A. Astengo, M. Basso, C. Zanacchi, Bennicelli, C.

MUTAT. RES., vol. 158, no. 1-2, pp. 19-30 LANGUAGE(S)- ENGLISH PUBL. DATE- 1985. TYPE- JOURNAL ARTICLE TAPE ISS- 86-04 COMPANY RELATED- Inst. Hyg Univ. Genoa, Via Pastore 1, 16132 Genoa, Italy NDN- 032-0086-4977-5

5 oil dispersants and a sample of paraffin were devoid of mutagenic activity in Ames reversion test with and without S9 mix, using 7 his S. typhimurium strain (TA1535, TA1537, TA1538, TA97, TA98, TA100, TA102). However, 3 dispersants produ

direct DNA damage in E. coli WP2, which was nonrepairable in repair-deficient strains (WP2uvrA, CM871, TM1080), as shown by two different DNA-repair test procedures. The observed genotoxic effects were considerably lowered in the presen of S9 mix containing liver S9 fractions from Aroclor-treated rats. These two short-term tests were effective in detecting the genotoxicity of both direct-actin compounds (such as 4-nitroquinoline N-oxide and methyl methanesulfonate) and procarcinogens (such as cyclophosphamide, 2-aminoanthracene and 2-aminofluorene).

EFFECTS OF OIL AND A DISPERSANT ON INTERTIDAL ORGANISMS IN FIELD EXPERIMENTS WITH A MESOCOSM, THE BREMERHAVEN CAISSON. - 0975775

Farke, H. Wonneberger, K. Gunkel, W. Dahlmann, G.

MAR. ENVIRON. RES., vol. 15, no. 2, pp. 97-114 LANGUAGE(S)- ENGLISH PUBL. DA 1985 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE ISS- 0885 COMPANY RELATED- Inst. Meeresforsch., 2850 Bremerhaven, FRG NDN- 032-0080-4992

Three medium-scale field experiments on the effects of oil, a dispersant and an oil/dispersant mixture were carried out in an intertidal mud flat ecosystem of the Wadden Sea (German Bight). For six successive tides each contaminant was added to water enclosed in a mesocosm during submersion of the flat. The fate of the oil in the sediment and effects on phytobenthos, bacteria and macrozoobenthos were studie Penetration of the oil into the sediment was mainly observed at the surface layer. Higher oil concentrations and lower boiling polycyclic hydrocarbons were present w oil was chemically dispersed. Sublethal effects were found in some macrofauna spec (reduced feeding activity) and in phytobenthic organisms (increased activity); oil degrading bacteria increased. No major effects were observed when the dispersant alone was added.

THE EFFECTS OF OIL AND OIL DISPERSANTS ON THE SKELETAL GROWTH OF THE HERMATYPIC CORAL DIPLORIA STRIGOSA . - 0933417

Dodge, R. E. Wyers, S. C. Frith, H. R. Knap, A. H. Smith, S. R. Sleeter, T. D

CORAL REEFS, vol. 3, no. 4, pp. 191-198 LANGUAGE(S)- ENGLISH PUBL. DATE- 19 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE ISS- 0585 COMPANY RELATED- Nova Univ. Oceanogr. Cent., 8000 N. Ocean Dr., Dania, FL 33004-3078, USA NDN- 032-0078-1141-8

Specimens of the hermatypic coral species Diploria strigosa were exposed to vario concentrations (1-50 ppm) of oil or oil plus dispersant for 6-24 h periods in four laboratory and two field experiments. Afterdosing, corals were transplanted to, or left in, the field and recollected approximately one year later for extension (linear) growth analysis by the alizarin stain method. No significant differences between extension growth parameters (Septa increase, Columella increase) and a calical shape parameter (New Endotheca Length) of treated corals versus controls w found in any of the experiments. In two summer experiments calical relief. (Fossa length) was found to be depressed in corals of some of the experimental treatments

BIOENERGETIC RESPONSES OF GAMMARUS SALINUS AND MYTILUS EDULIS TO OIL AND OIL DISPERSANTS IN A MODEL ECOSYSTEM. - 0831010

Carr, R. S. Linden, O.

MAR. ECOL. (PROG. SER.), vol. 19, no. 3, pp. 285-291 LANGUAGE(S)- ENGLISH PUBL. DATE- 1984. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8501 COMPANY RELATED- Battelle New England Mar. Res. Lab., 397 Washing St., Duxbury, MA, USA NDN- 032-0075-0298-7

As part of a multifaceted study to assess the impact of oil and oil dispersants on model littoral ecosystem in the Baltic Sea, bioenergetic (O:N ratio) measurements were made for 2 of the predominant species, the mussel Mytilus edulis and the amphipod Gammarus salinus . In addition, ammonia excretion and respiration rate measurements for G. salinus and byssal thread production rates and spawning frequency observations for M. edulis were made. Four days after the start of the exposure, significant effects on byssal thread production rates and spawning frequency were observed for the oil/dispersant treatment. After 12 d the oil/dispersant group apparently had recovered whereas the oil-only group was exhibiting abnormal spawning behavior.

Pete Peterson

RELATIVE TOXICITY OF DISPERSANTS IN MYTILUS .IRIDIS AND MACROBRACHIUM IDELLA . - 0747491

d'Silva, C. Row, A.

INDIAN J. MAR. SCI., vol. 13, no. 1, pp. 42-44 LANGUAGE(S)- ENGLISH PUBL. DATE- 1984. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0884 COMPANY RELATED- Natl. Inst. Oceanogr., Dona Paula, Goa 403 004, India NDN- 032-0070-8141-6

There was a great variation in the relative toxicity of different oil dispersants. Dispersant IB 2780 was most toxic and dispersant IB 11/80 was not lethal at the highest concentration tested. The ranking order of the emulsions (oil dispersant) wa almost identical for both the species tested, although there was a significant shift in the range of LC sub(50) values, indicating that one species is less sensitive tha the other. Oil dispersant mixtures were less toxic than the dispersants alone.

UPTAKE OF PETROLEUM HYDROCARBONS BY THE BLUE MUSSEL (MYTILUS EDULIS L.) AFTER EXPERIMENTAL OILING AND HIGH PRESSURE, HOT WATER SHORE CLEANING. - 0729892

Ganning, B. Broman, D. Lindblad, C.

MAR. ENVIRON. RES., vol. 10, no. 4, pp. 245-254 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0784 COMPANY RELATED- Dep. Zool., Univ. Stockholm, S-106 91 Stockholm, Sweden NDN- 032-0070-2255-2

High pressure, hot water shore cleaning after an oil spill will release high concentrations of petroleum hydrocarbons to ambient marine ecosystems. The immediate increase of hydrocarbons observed in blue mussels, M. edulis, went from background concentrations of 40 mu g/g to 657 mu g/g and 533 mu g/g at a distance of 3 and 8 m respectively from the shore. After two weeks the accumulated oil had decreased by 20-45%. In comparison natural surf and ice cleaning of shores will only produce a small increase in hycrocarbon concentrations. The authors recommend that high pressure, hot water cleaning not be used in areas where no special bird or wild life protection is needed.

ARCTIC ENERGY RESOURCES. - 0730732

Rey, L. (ed.)

COLD REG. SCI. TECHNOL., vol. 7 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE CONF. NAME- Comite Arctique International Conference on Arctic Energy Resources CONF. PLACE- Oslo (Norway) CONF. DATE- 22 Sep 1982 NOTES- Special issue on Arctic energy resources. TAPE NUMBER- 0784 COMPANY RELATED- Environ. Prot. Group, Pet. Canada, P.O. Box 2844, Calgary, Alta., Canada T2P 3E3 NDN- 032-0070-1924-3

Of necessity, Canada has gradually become a world leader in arctic marine oil spill research. Initial efforts aimed to strengthen existing containment and recovery equipment to operate in light ice conditions. When the limits of this technology wer rapidly reached, research turned to developing burning techniques, including fireproof booms, in situ burning against ice edges and in spring melt pools, air deployable igniters and portable burners and incinerators. New dispersant technology was developed for aerial application, for cold water dispersion and for solidification, for cold water dispersion and for solidification. The effects of dispersed oil in the arctic nearshore and onshore environment has become an importan area of study.

A HALOTOLERANT, BIOSURFACTANT-PRODUCING BACILLUS SPECIES POTENTIALLY USEFUL FOR ENHANCED OIL RECOVERY. - 0718113

Jenneman, G. E. McInerney, M. J. Knapp, R. M. Clark, J. B. Feero, J. M. Revus, D. E. Menzie, D. E.

DEV. IND. MICROBIOL., vol. 24, pp. 485-492 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE CONF. NAME- 39. Annual Meeting of the Society for Industrial Microbiology CONF. PLACE- St. Paul, M (USA) CONF. DATE- 14-20 Aug 1982 TAPE NUMBER- 0684 COMPANY RELATED- Dep. Bot. and Microbiol., Univ. Oklahoma, Norman, OK 73019, USA NDN- 032-0059-1536-8

A biosurfactant-producing Bacillus licheniformis was isolated from oil-field injection water with properties potentially useful for in situ enhanced oil recovery Conventional miscible flooding procedures use expensive synthetic detergents such as petroleum sulfonates that precipitate in high NaCl brines and adsorb to rock surfaces. The Bacillus sp. produced a biosurfactant when grown at 40 C in a sucrose mineral salts medium containing 5% NaCl. The biosurfactant was produced during the log phase of growth in the presence or absence of either crude oil or hexadecane. Th

surface tension of a 5% NaCl solution decreased from 74.0 mN/m to 27 mN/m when the surfactant was added.

EFFECTS OF CRUDE OIL AND CHEMICAL DISPERSANT ON PHOTOSYNTHESIS IN THE BRAIN CORAL DIPLORIA STRIGOSA . - 0687859

Cook, C. B. Knap, A. H.

MAR. BIOL., vol. 78, no. 1, pp. 21-27 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0584 COMPAN RELATED- Bermuda Biol. Stn. Res., Ferry Reach 1-15, Bermuda NDN- 032-0068-8627-7

An eight-hour exposure of Diploria strigosa to a mixture of Arabian Light crude oil (19 ppm) and the chemical dispersant Corexit 9527 (1 ppm) in a flowing seawater system reduced photosynthesis by symbiotic zooxanthellae by 85%, while either oil or dispersant alone had no effect. The greatest effect of crude oil plus dispersant occurred in the incorporation of photosynthetic products into lipids. Synthesis of wax esters and triglycerides, the major storage lipids, was particularly affected. Total carbon fixation was restored within 3-5 h after treatment, and lipid synthesis was restored within 5-24 h after exposure.

EFFECT OF OIL AND DISPERSANT ON GROWTH AND CHLOROPHYLL A CONTENT OF THE MARINE MICROALG TETRASELMIS SUECICA . - 0648125

Fabregas, J. Herrero, C. Veiga, M.

APPL. ENVIRON. MICROBIOL., vol. 47, no. 2, pp. 445-447 LANGUAGE(S)- ENGLISH PUBL. DATE- 1984. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0384 COMPANY RELATED- Dep. Microbiol., Fac. Farm. y Med., Univ. Santiago Santiago de Compostela, Spain NDN- 032-0067-4739-3

Low hydrocarbon concentrations stimulated the growth of T. suecica , whereas higher concentrations (200 ppm) inhibited growth. The content of chlorophyll a in this microalga was affected in a similar way. Crude oil had the most marked effects. Dispersant SEAKLIN-101-NT and mixtures of oil and SEAKLIN-101-NT did not show selective toxicity for the microalga, although inhibitory effects could be observed at high concentrations.

ENHANCED OIL RECOVERY: ENVIRONMENTAL ISSUES AND STATE REGULATORY PROGRAMS. - 0622040

Millemann, R. E. Haynes, R. J. Boggs, T. A. Hildebrand, S. G.

ENVIRON. INT., vol. 7, no. 3, pp. 165-177 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0284 COMPANY RELATED- Environ. Sci. Div., Oak Ridge Natl. Lab., Oak Ridge, TN 37830, USA NDN- 032-0066-8510-7

During 1977-78, Oak Ridge National Laboratory prepared environmental impact assessments for nine U.S. Department of Energy-sponsored enhanced oil recovery (EOR) field demonstration projects located in six states and reviewed the oil regulations for all oil-producing states. These evaluations revealed some potentially important environmental impacts associated with EOR including pollution of land and surface waters from spills or leaks of oil and brine or other chemicals, loss of biota and, contamination of groundwater. Potential groundwater impacts include production of toxic and carcinogenic substances from synergistic interactions among chemicals used primarily in the micellar-polymer flooding technique. For use of EOR techniques to expand in an environmentally acceptable manner, environmental planning (including monitoring, protection measures, and reclamation strategies) must be an integral par of the initial project development. Acceptable monitoring, prevention, mitigation, and reclamation procedures are available for most of the identified environmental problems, but the best techniques may not be known by operators or required by law.

EFFECTS OF HIGH PRESSURE, HOT WATER SHORE CLEANING AFTER OIL SPILLS ON SHORE ECOSYSTEMS IN THE NORTHERN BALTIC PROPER. - 0596926

Broman, D. Ganning, B. Lindblad, C.

MAR. ENVIRON. RES., vol. 10, no. 3, pp. 173-187 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0184 COMPANY RELATED- Dep. Zool., Univ. Stockholm, S-106 91 Stocknolm, Sweden NDN- 032-0065-7471-1

The use of high pressure, hot water hosing techniques in oil spill clean-up operations on rocky and stony-gravelly shores drastically reduces the snore vegetation and macrofauna. The negative effects are more year the hot water cleaned shores were not restored completely. On rocky shores the high pressure, hot water technique is very efficient in terms of freeing the rocks from oil. However, due to its detrimental effects on shore organisms this type of oil spill clean-up operation

can only be recommended for bird or wildlife protection areas. The clean-up method i inefficient on stony-gravelly shores due to penetration of oil into the ground and sediment and direct killing of shore organisms. The method should be avoided on thes types of shores.

FIELD EXPERIMENTS ON THE EFFECTS OF CRUDE OIL AND DISPERSANT ON THE COMMON ANIMALS AND PLANTS OF ROCKY SEA SHORES. - 0596987

Crothers, J. H.

MAR. ENVIRON. RES., vol. 8, no. 4, pp. 215-239 LANGUAGE(S)- ENGLISH PUBL. DATE 1983 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0184 COMPANY RELATED- Leonard Wills Field Cent., Nettlecombe Court, Williton, Taunton, Somerset TA4 4HT, UK NDN- 032-0065-7431-0

In experiments on the Somerset coast, forties crude oil and BP 1100WD dispersant wer sprayed on to small areas of the rocky shore over a period of several days to stimulate conditions following an oil spill. Detailed observations were at monthly intervals of marked 0 multiplied by 1 m super(2) quadrats within (and without) the treated areas. Some areas received oil only, others dispersant only, and the third set received oil followed by dispersant. The experiments were in two parts, the one to simulate a July incident and the other a January incident. Limpets and the small winkles living in and between empty barnacle shells were the most obviously affected organisms. The sites that received both oil and dispersant were most seriously upset but the oil areas came next. The effect of BP 1100WD on its own as applied in this experiment was relatively slight.

STUDY OF OIL-WATER PARTITIONING OF A CHEMICAL DISPERSANT USING AN ACUTE BIOASSAY WITH MARINE CRUSTACEANS. - 0601165

Wells, P. G. Abernethy, S. Mackay, D.

CHEMOSPHERE, vol. 11, no. 11, pp. 1071-1086 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0184 COMPANY RELATED- Bedford Inst. Oceanogr., P.O. Box 1006, Dartmouth, N.S., Canada B2Y 4A2 NDN- 032-0065-6672-6

The toxicity of seawater dispersions of a chemical dispersant to two marine crustaceans was investigated in the presence and absence of various quantities of a non-toxic mineral oil. From the results and a physical-chemical partitioning analysis, a limiting value of the oil-water partition coefficient of the toxic compounds is deduced suggesting that esentially all of the toxic compounds in the dispersant will partition into solution in water following dispersant application to an oil spill. This conclusion simplifies interpretation and prediction of the toxic effects of a dispersed oil spill.

BIODETERIORATION 5. - 0608822

Oxley, T. A. Barry, S. (eds.)

pp. 382-294. LANGUAGE(S)- ENGLISH PUBL. DATE- 1983 TYPE- BOOK CONF.NAME- 5. International Biodeterioration Symposium CONF.PLACE- Aberdeen (UK) CONF.DATE- Sep 1981 ISBN- ISBN 0-471-10296-2 TAPE NUMBER- 0184 COMPANY RELATED- Univ. Rhode Island, Kingston, RI 02881, USA NDN- 032-0065-4117-1

This chapter summarizes data on the effect of oil dispersion on the potential of natural microbial population to metabolize petroleum hydrocarbons. The work is a portion of a larger project to assess dispersant treated vs. untreated oil spills in marine environments. The introduction of oil or dispersed oil into seawater did not invoke a significant increase in the size of the heterotrophic population of the seawater, but did result in an enrichment for hydrocarbon utilizers except at very low temperatures. Whereas the percentage changes associated with the enrichment was great, the increases in real numbers of hydrocarbon utilizers was minor and apparently have little effect on hydrocarbon turnover values. The hypothesis by Stevenson (1978) of physiological dormancy in bacteria suspended in water may accoun for the unexpected minimum responses of the seawater populations to oil and disperse oil. The hypothesis does not imply no metabolic activity, but rather a state below maximum potential because of nutrient limitation and physical stresses.

BIODEGRADATION OF NON-IONIC DISPERSANTS IN SEA-WATER. - 0614070

Una, G. V. Garcia, M. J. N.

EUR. J. APPL. MICROBIOL. BIOTECHNOL., vol. 18, no. 5, pp. 315-319 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0184 COMPANY RELATED- Fac. Chem., Dep. Chem. Eng., Univ. Santiago d Compostela, Santiago, Spain NDN- 032-0065-2226-7

In this paper, the authors describe the aerobic biodegradation of some non-ionic dispersants of the Span, Tween, and Corexit series in sea-water, where they are now more frequently found as a result of their application to the removal of oil spils. First, the extent to which dispersants are biodegraded, as an indication of their suitability for use on a large scale, is discussed. Biodegradation may be carried ou by means of monocultures or mixed cultures of marine bacteria of the genera Aeromonas, Pseudomonas, and Flavobacterium. Analytical techniques based on absorbance measurements were used to follow the process. On the other hand, by determining the kinetics of the biodegradation process a more complete analysis is obtained. The kinetic coefficients controlling the process are deduced and it is shown that for some dispersants the experimental results are in close agreement with the proposed scheme.

FEEDING BEHAVIOR OF DAPHNIA PULEX IN CRUDE OIL DISPERSIONS. - 0570427

Wong, C. K. Strickler, J. R. Engelhardt, F. R.

BULL. ENVIRON. CONTAM. TOXICOL., vol. 31, no. 2, pp. 152-157 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. TYPE- JOURNAL ARTICLE TAPE NUMBER- 1283 COMPANY RELATED- Dep. Zool., Univ. Toronto, Erindale Campus, Mississauga, Ont., Canada L5L 1C6 NDN- 032-0064-9024-2

The present investigation was conducted to examine the effects of a crude oil on the feeding bahevior pattern of Daphnia pulex, a species which is commonly used for toxicity tests. Previous studies have shown that crude oils are toxic to Daphnia, feeding behavior was selected as an effects index because it is important to survival and reproduction and its pattern has been studied in detail.

THE INFLUENCE OF AN OIL DISPERSANT CHEMSERVE OSE-DH ON THE VIABILITY OF SEA URCHIN GAMETES, COMBINED EFFECTS OF TEMPERATURE, CONCENTRATION AND EXPOSURE TIME ON FERTILIZATION. - 0529480

Greenwood, P. J.

AQUAT. TOXICOL., vol. 4, no. 7, pp. 15-29 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8310 COMPANY RELATED- NRIO Mar. Pollut. Unit, c/o Dep. Oceanogr., Univ. Cape Town, Rondebosch 7700, Rep. South Africa NDN- 032-0062-5475-3

The combined effects of concentrations of an oil dispersant, Chemserve OSE-DH, temperature, and exposure time, on the viability of pretreated gametes of the sea urchin Parechinus angulosus, is reported. The importance of the influence of temperature and prefertilization exposure on gamete viability is shown. Temperature fluctuations affect sperm viability to a marked extent with little effect being evident where ova are concerned. Increased exposure to Chemserve OSE-DH has a cumulative, deleterious effect on ova viability. The interactive effects of the variables appear to magnify the overall deterioration of gametes subjected to the stressed conditions.

EFFECT OF THE DISPERSANT COREXIT 9527 ON THE MICROBIAL DEGRADATION OF SULFUR HETEROCYCLES IN PRUDHOE BAY OIL. - 0533274

Foght, J. M. Fedorak, P. M. Westlake, D. W. S.

CAN. J. MICROBIOL., vol. 29, no. 5, pp. 623-627 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH, FRENCH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8310 COMPANY RELATED- Dep. Microbiol., Univ. Alberta, Edmonston, Alta., Canada T6G 2E9 NDN- 032-0062-2923-0

Samples from a previous study observing the effects of Corexit 9527 on microbial degradation of aromatics and saturates in crude oil were reanalyzed by capillary gas chromotography with a sulfur-specific detector. The results shown an inhibitory effect on degradation of sulfur heterocycles (such as benzothiophenes and dibenzothiophenes), dependent upon dispersant concentration and nutrient supplementation.

PUTTING AN OIL SPILL CLEANUP COMPUTER MODEL TO WORK FOR THE NAVY. - 0473057

Nyhart, J. D. Psaraftis, H. N. Yaroschak, P. J.

NAV. ENG. J., vol. 95, no. 3, pp. 165-172 LANGUAGE(S)- ENGLISH PUBL. DATE- 1983. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0883 COMPANY RELATED- Sloan Sch. Manage., Massachusetts Inst. Technol., Cambridge, MA 02139, USA NDN- 032-0060-9413-0

The first phase of the development of a computer assisted model for analyzing complex decisions and policies regarding oil spill cleanup has been completed. The model can be used, among other things, in strategic planning for the long-term oil spill

response needs of a region, in assisting on Scene Coordinators in responding to a specific spill (tactical/operational setting), in evaluating the environmental and economic damages of a spill versus the cost of various policy and regulatory issues such as the effects of delays, the use of dispersants and the investigation of liability and compensation issues. The paper describes the model in detail.

ENVIRONMENTAL EFFECTS (1969 TO 1981) OF A REFINERY EFFLUENT DISCHARGED INTO LITTLEWICK BAY, MILFORD HAVEN. - 0469861

Petpiroon, S. Dicks, B.

FIELD STUD., vol. 5, no. 4, pp. 623-641 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 0783 COMPAN RELATED- Phuket Mar. Biol. Cent., P.O. Box 60, Phukert Isle, Thailand NDN- 032-0059-7118-2

Marine habitats within Milford Haven, Wales, have received a variety of contaminant from four refineries, a tank farm, and oil tanker activities since 1960, in addition to inputs of sewage, urban run-off, light industrial effluents and contaminants from a naval dockyard. Inputs from the oil industry have mainly been of crude oil, dispersant chemicals (used in the clean-up of spills) and refinery effluents. This paper summarises changes observed in rocky shore communities between 1969 and 1981 around a refinery effluent discharge in Littlewick Bay on the north shore of the Haven. The findings of recent studies were very similar to those of the earliest one in this bay. Observed effects have been restricted throughout the survey period (1969-1981) to within about 200 m of the discharge point and have taken the form of reductions in the numbers of several shore species but notably grazing gastropods (Littorina and Patella) with corresponding increases in the abundance of fucoid algae. Changes in barnacle populations have also taken place.

OIL SPILL CLEANUP FULFILLS AIM OF FEDERAL WATER POLLUTION CONTROL ACT. - 0413061

Silver, M.

NAT. RESOUR. J., vol. 22, no. 2, pp. 489-492 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8304 COMPANY RELATED- Address not stated NDN- 032-0058-7021-3

On April 3, 1975, during a labor strike at the terminal, unknown vandals entered Union's yard and discharged oil from two tank cars owned by, and leased to third parties. The decision in Union Petroleum Corp. v. United States reaffirms the federal judiciary's commitment to control water pollution under the Federal Water Pollution Control Act. Those in charge of oil terminals who have taken reasonable precautions to prevent vandalism and oil spills into navigable rivers will be reimbursed when vandals spill oil from tank cars parked at the terminal. Awarding Union the full $99,952.17 encourages other terminal operators to quickly cleanup harmful discharges into the nation's waters. The decision is also noteworthy for wha it did not say. Union's yard was not entirely and securely enclosed, and the termina continued to operate 24 hours per day under strike conditions. The court, however, did not penalize Union for such activity. Nor did the court require Union to take extraordinary measures to prevent oil spills from reaching Chelsea Creek.

CORRELATION OF DISPERSANT EFFECTIVENESS AND TOXICITY OF OIL DISPERSANTS TOWARDS THE ALG CHLAMYDOMONAS REINHARDTI . - 0402459

Bratbak, G. Heldal, M. Knutsen, G. Lien, T. Norland, S.

MAR. POLLUT. BULL., vol. 13, no. 10, pp. 351-353 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8301-03 COMPANY RELATED- Dep. Microbiol., Plant Physiol., Univ. Bergen, Allegt. 70, 5000 Bergen, Norway NDN- 032-0057-3716-1

Using synchronous cultures of the unicellular green alga Chlamydomonas reinhardti , the toxicities of mixtures of Ekofisk crude oil and oil dispersants were measured. Sixteen so-called concentrates and 10 solvent-based dispersants were tested. The dispersing effectiveness of these compounds with respect to the Ekofisk crude oil wa also measured. The concentrates were tested undiluted as well as diluted using algal growth medium (2ppt. salinity) and artificial sea water (35ppt. salinity) as dispersing liquid. The solvent-based compounds were tested in algal medium. For all compounds significant correlations between their toxicity and their effectiveness in dispersing the Ekofisk oil were found, such that the more effective the compound, th more toxic it was.

EFFECTS OF A CHEMICAL DISPERSANT AND CRUDE OIL ON BREEDING DUCKS. - 0382557

Albers, P. H. Gay, M. L.

BULL. ENVIRONM. CONTAM. TOXICOL., vol. 29, no. 4, pp. 404-411 LANGUAGE(S)- ENGLI
PUBL. DATE- 1982. TYPE- JOURNAL ARTICLE TAPE NUMBER- 8301-03 COMPANY
RELATED- U. S. Fish Wildl. Serv., Patuxent Wildl. Res. Cent., Laurel, MD 20708, USA
NDN- 032-0056-7274-9

A widely used chemical oil dispersant, Corexit 9527, when applied to the egg shell small amounts (5 and 20 mu l), is as toxic to mallard embryos as crude oil itself. However, nothing is known about the effects of oil chemically dispersed in water on bird eggs or on the nesting behavior of breeding birds; nor is it known if dispersants can keep oil from adhering to birds. This study was conducted to evalua the effects of Corexit 9527 and crude oil sprayed with Corexit 9527 on breeding mallard ducks.

EFFECT OF OIL AND OIL DISPERSANT MIXTURES ON THE BASAL METABOLIC RATE OF DUCKS. - 0382035

Lambert, G. Peakall, D. B. Philogene, B. J. R. Engelhardt, F. R.

BULL. ENVIRON. CONTAM. TOXICOL., vol. 29, no. 5, pp. 520-524 LANGUAGE(S)- ENGLIS
PUBL. DATE- 1982. TYPE- JOURNAL ARTICLE TAPE NUMBER- 8301-03 COMPANY
RELATED- Natl. Wildl. Res. Cent., Canadian Wildl. Serv., Ottawa, Ont. K1A 0E7, Cana
NDN- 032-0056-7048-0

Although some studies have been carried out on the effects of crude oil on the basi metabolic rate (BMR) of ducks none have assessed the combination of oil plus dispersant. Since the use of dispersants is a potentially major tool in the handlin of oil spills, it seems advisable to study this problem so as to be able to make a rational decision whether or not to use dispersants when there is a threat to seabirds.

EFFECT OF IXTOC I CRUDE OIL AND COREXIT 9527 DISPERSANT ON SPOT (LEIOSTOMUS XANTHURUS) EGG MORTALITY. - 0375152

Slade, G. J.

BULL. ENVIRON. CONTAM. TOXICOL., vol. 29, no. 5, pp. 525-530 LANGUAGE(S)- ENGLIS
PUBL. DATE- 1982. TYPE- JOURNAL ARTICLE TAPE NUMBER- 8301-03 COMPANY
RELATED- Duke Univ., Durham, NC 27706, USA NDN- 032-0056-3967-9

In this study the author compares the effects of Ixtoc I crude and Corexit 9527 on the egg mortality of a fish species occurring in the Gulf of Mexico. Although the species used in this study - spot, Lejostomus xanthurus , is not important as a commercial food fish in the gulf, their early life history is similar to other more significant gulf sciaenids, e.g., Micropogonias undulatus and Sciaenops ocellata . L. xanthurus spawn during the fall and early winter in nearshore ocean waters and produce floating eggs, 0.8 mm in diameter, which hatch in 48 h at 20 degree C.

OIL SPILL CLEANUP FULFILLS AIM OF FEDERAL WATER POLLUTION CONTROL ACT. - 0413061

Silver, M.

NAT. RESOUR. J., vol. 22, no. 2, pp. 489-492 LANGUAGE(S)- ENGLISH PUBL. DATE-
1982. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8304-(
COMPANY RELATED- Address not stated NDN- 032-0054-3289-1

On April 3, 1975, during a labor strike at the terminal, unknown vandals entered Union's yard and discharged oil from two tank cars owned by, and leased to third parties. The decision in Union Petroleum Corp. v. United States reaffirms the federal judiciary's commitment to control water pollution under the Federal Water Pollution Control Act. Those in charge of oil terminals who have taken reasonable precautions to prevent vandalism and oil spills into navigable rivers will be reimbursed when vandals spill oil from tank cars parked at the terminal. Awarding Union the full $99,952.17 encourages other terminal operators to quickly cleanup harmful discharges into the nation's waters. The decision is also noteworthy for wha it did not say. Union's yard was not entirely and securely enclosed, and the termina continued to operate 24 hours per day under strike conditions. The court, however, did not penalize Union for such activity. Nor did the court require Union to take extraordinary measures to prevent oil spills from reaching Chelsea Creek.

THE EFFECTS OF OIL, DISPERSANT, AND EMULSIONS ON THE SURVIVAL AND BEHAVIOR OF AN ESTUARINE TELEOST AND AN INTERTIDAL AMPHIPOD. - 0306666

Butler, R. G. Trivelpiece, W. Miller, D. S.

ENVIRON. RES., vol. 27, no. 2, pp. 266-276 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982 SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 82 COMPANY RELATED- Dep. Biol. Sci., Duquesne Univ., Pittsburgh, PA 15219, USA 032-0052-4205-6

Killifish (Fundulus heteroclitus) and amphipods (Gammarus oceanicus) were expos separately to either a No. 2 fuel oil, AP dispersant, or emulsions of the two in static system. Both species exhibited a concentration-dependent response to all treatments. However, emulsification of oil with dispersant clearly increased its lethal effect on killifish survival, but did not cause a differential change in behavioral parameters such as schooling, chafing, substrate nipping, activity, or depth preference. Killifish exposed to conditions of thermal or osmotic stress we more sensitive to the lethal effects of emulsions. In contrast, emulsions caused quantitative changes in amphipod activity and precopulatory behavior, but did not increase mortality beyond that caused by exposure to oil alone. Changes in salini had little effect on amphipod sensitivity to emulsions, but decreasing temperatur did result in increased survival.

OIL AND PLANKTONIC ECOSYSTEMS. - 0306256

Davenport, J.

PHILOS. TRANS. R. SOC. LOND., SER. B, vol. 297, no. 1087, pp. 369-384 LANGUAGE(S)- ENGLISH PUBL. DATE- 1982. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8210-12 COMPANY RELATED- N.E.R.C. Unit Mar. Invertebr. Biol., Mar. Sci. Lab., Univ. Coll. North Wales, Menai Bridge, Gwynedd SEH, UK NDN- 032-0052-4064-3

Information about the effects of oil and oil products upon planktonic organisms is much sparser than for nekton or benthos because of the problems of quantitative plankton analysis. The data available derive from three sources: laboratory experiments, studies with enclosed ecosystems and test organisms (e.g. Lepex, phytoplankton cages) and from field observations made in oil-affected areas. Laboratory experiments have tended to be conducted at unrealistically high hydrocarbon concentrations upon planktonic species that are amenable to laboratory conditions. However, such investigations have shown that the early oil dispersants were very toxic and revealed the great differences between the toxicities of crude oils from various oil fields. Sublethal studies have shown that hydrocarbons, especially the high aromatic fractions, can damage development and alter behaviour and physiology in planktonic organisms. Biochemical investigations have demonstrat both accumulation and depuration of hydrocarbons (including carcinogens) in plankt

METABOLISM OF COMPLEX MIXTURES OF OIL SPILL SURFACTANT COMPOUNDS BY A REPRESENTATIVE TELEOST (SALMO GAIRDNERI), CRUSTACEAN (CANCER IRRORATUS), AND MOLLUSC (CHLAMYS ISLANDICUS). - 0281539

Payne, J. F.

BULL. ENVIRON. CONTAM. TOXICOL., vol. 28, no. 3, pp. 277-280 LANGUAGE(S)- ENGLI PUBL. DATE- 1982 TYPE- JOURNAL ARTICLE TAPE NUMBER- 8207-09 COMPANY RELATED- Res. & Resour. Serv., Dep. Fish. Oceans, P.O. Box 5667, St. John's, Nfld. Canada A1C 5X1 NDN- 032-0051-6462-8

In reference to sublethal toxicity, one important criterion for the ecotoxicologic assessment of any compound is its susceptibility to metabolism by target and non-target organisms. There is presently little information to indicate that aquati organisms can degrade the active surfactant ingredients found in commercial oil dispersant formulations. A colorimetric method for the detection of free fatty acid was adapted to assay esterase activity with polyethoxylate fatty acid ester substrates. It was possible with this method to demonstrate that a representative teleost, crustacean and mollusc have the capacity for enzymatic hydrolysis of the complex fatty acid ester mixtures found as surfactants in the new generation oil spill dispersants.

DEVELOPMENTS IN INDUSTRIAL MICROBIOLOGY. - 0267092

Underkofler, L. A. Wulf, M. L. (eds.)

DEV. IND. MICROBIOL., vol. 22 LANGUAGE(S)- ENGLISH PUBL. DATE- 1981. SUMMAR LANGUAGE(S)- ENGLISH TYPE- BOOK CONF. NAME- 37. General Meeting of the Society for Industrial Microbiology CONF. PLACE- Flagstaff, AZ (USA) CONF. DATE- 9-13 Au 1980 ISSN- ISSN: 0070-4563 TAPE NUMBER- 8207-09 COMPANY RELATED- Dep. Bot. & Microbiol., Univ. Oklahoma, Norman, OK 73019, USA NDN- 032-0051-1004-8

DIFFERENCES IN THE TOXICITIES OF AN OIL DISPERSANT AND A SURFACE ACTIVE AGENT TO SOME MARINE ANIMALS AND THEIR IMPLICATIONS IN THE CHOICE OF SPECIES IN TOXICITY TESTING. - 0161721

Wu, R. S. S.

MAR. ENVIRON. RES., vol. 5, no. 2, pp. 157-163 LANGUAGE(S)- ENGLISH PUBL. DA 1981. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8201 COMPANY RELATED- Fisheries Station, Aberdeen, Hong Kong NDN- 032-0047-0052-0

The toxicities of an oil dispersant (BP 1100X) and a surface active agent (Shell Herder) upon 18 marine species from different taxa, were investigated. The results showed that the toxicity of a product depends very much on the species tested. Some species exhibited high mortality when treated with BP 1100X, and low mortality when treated with Shell Herder, whereas the reverse was true for certain other species. The results therefore indicated a large bias potentially incurred in present procedures, by the use of one or two species in toxicity testing and screening of dispersants/surface active agents. It is here suggested that toxicity tests should be carried out on species which are ecological important (e.g., key species of a community or population with a high energy flow value) in identified receiving environments.

TOXICITY TESTING OF OIL SLICK DISPERSANTS IN HONG KONG. - 0115686

Thompson, G. B. Wu, R. S. S.

MAR. POLLUT. BULL., vol. 12, no. 7, pp. 233-237 LANGUAGE(S)- ENGLISH PUBL. DATE- 1981. SUMMARY LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE TAPE NUMBER- 8201-03 COMPANY RELATED- Fisheries Res. Stat., Aberdeen, Hong Kong NDN- 032-0045-5644-4

In Hong Kong, the toxicity of oil spill dispersants was assessed in a preliminary screening test, based upon TD sub(5) sub(0) values in samples of ten fish. Later, an improved test was introduced, based upon new procedures developed in the United Kingdom and modified to suit conditions in Hong Kong. Products approved elsewhere were usually, but not always, approved in Hong Kong. Further work is needed to relate the results to oil-spill damage in local waters.

THE 'SLICKTRAIL' DESIGN, A COMBINATION OF A TRAILING SUCTION HOPPER DREDGER AND AN OIL RECOVERY VESSEL. (PRESENTED AT: INTERMARITEC '80, HAMBURG, INTERNATIONAL CONFERENCE ON MARINE SCIENCES AND OCEAN ENGINEERING; HAMBURG (GFR); 1980). - 81-10 05713

VAN DRIMMELEN, N. J. BARNEVELD BINKHUYSEN, J. P. F.

IN: INTERMARITEC '80, HAMBURG. INTERNATIONAL CONFERENCE ON MARINE SCIENCES AND OCEAN ENGINEERING. CONFERENCE REPORT. / INTERMARITEC '80, HAMBURG. INTERNATIONAL KONGRESS FUER MEERESFORSCHUNG UND MEERESTECHNIK. KONGRESS-BERICHTSWERK. PUBL. BY: HAMBURG MESSE UND CONGRESS: HAMBURG (GFR). 1980. P. 610-621 IMT 80-312 LANGUAGE(S)- ENGLISH AFFILIATION- (IHC HOLLAND NV, KINDERDIJK, NETHERLANDS) TYPE- BOOK : CHAPTER NDN- 032-0044-7390-3

IN RECENT YEARS THE PROBLEM OF POLLUTION OF THE SEAS FOLLOWING OIL SPILLAGES HAS BECOME A FOCAL POINT OF INTEREST. MAJOR SPILLAGES HAVE SHOWN THAT TO DATE THERE ARE NO EFFECTIVE MEANS FOR DEALING WITH POLLUTION ON A LARGE SCALE. CHEMICAL CONTROL WITH THE AID OF DETERGENTS HAS THE DISADVANTAGE THAT THE OIL REMAINS IN THE MARINE ENVIRONMENT FOR A LONG TIME. MOREOVER THE DETERGENT USED INITIALLY PROVED TO BE TOXIC IN GREATER OR LESSER DEGREE. IN THE NETHERLANDS THE NORTH SEA DIRECTORATE OF THE NETHERLANDS STATE WATERWAYS BOARD HAS FOR SOME TIME BEEN ENGAGED IN RECOVERY OF OIL SPILLAGES. THE BOARD OWNS AND OPERATES THE OIL RECOVERY VESSEL SMAL AGT WHICH IS EQUIPPED WITH OIL SWEEPING ARMS AND EXCELLENT RESULTS HAVE ALREADY BEEN OBTAINED DURING RECENT OIL RECOVERY OPERATIONS. IHC HOLLAND, IN COLLABORATION WITH THE STATE WATERWAYS BOARD HAS NOW DESIGNED A VESSEL WHICH COMBINES THE ROLE OF AN OIL RECOVERY VESSEL WITH THAT OF A MODERN TRAILING SUCTION HOPPER DREDGER. THE SLICKTRAIL IS EQUIPPED WITH THE SAME TYPE OF SWEEPING ARMS AS THE SMAL AGT, BUT THE STORAGE CAPACITY OF THE SLICKTRAIL IS SIGNIFICANTLY GREATER. IT IS AVAILABLE 24 HOURS A DAY TO DEAL WITH AN OIL SPILLAGE AT SEA, BUT UNTIL SUCH TIME ONE OCCURS IT FULFILS IT OTHER SPECIALISED ROLE, THAT OF A TRAILING DREDGER FOR MAINTENANCE WORK. THE DESIGN CONFORMS TO INTERNATIONAL SAFETY REQUIREMENTS, HAS RECEIVED THE APPROVAL OF THE NETHERLANDS SHIPPING INSPECTORATE AND MEETS THE STANDARDS LAID DOWN BY THE CLASSIFICATION SOCIETIES. A FIRST 'SLICKTRAIL'-DREDER HAS BEEN ORDERED LAST YEAR BY JOINT VENTURE OF DUTCH CONTRACTORS. THIS SHIP IS UNDER CONSTRUCTION AT IHC SMITH KINDERDIJK (HOLLAND) AND WILL BE DELIVERED END OF 1980.

US/FRENCH COMPARE OIL SPILL TOOLS. - 81-07 04256

CRAWFORD, D.

OFFSHORE, 40(14), 108-115 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (ADDRESS NOT STATED) TYPE- JOURNAL ARTICLE : REVIEW RDN- 032-0042-3980-3

THE ARTICLE DESCRIBES SOME OF THE HIGHLIGHTS OF THE TECHNIQUES OF AND APPROACHES TO OIL SPILL CLEANUPS PRESENTED AT THE COASTAL AND OFFSHORE OIL POLLUTION CONFERENCE - THE FRENCH AND AMERICAN EXPERIENCE AT WHICH THE FRENCH GOVERNMENT AGENCY FOR TECHNICAL INDUSTRIAL AND ECONOMIC CO-OPERATION (ACTIM) MET WITH MEMBERS OF THE SPILL CONTROL ASSOCIATION OF AMERICA (SCAA).

TEXAS, 1979-EXPERIENCE WITH MARCO FILTERBELT SKIMMERS ON IXTOC 1 AND BURMAH AGATE CRUDE OIL SPILLS. /(PRESENTED AT: OCEANS '80: SEATTLE, WA (USA): 8 SEP 1980). - 81-07 04483

BLACKBOURN, S. R.

OCEANS '80, OCEANS '80. AN INTERNATIONAL FORUM ON OCEAN ENGINEERING IN THE '80S. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, SEATTLE, WA (USA). PUBL. BY: IEEE: NEW YORK, NY (USA), 1980, P. 398-406. IEEE-80CH1572-7 LANGUAGE(S)- ENGLISH AFFILIATION- (MARCO POLLUTION CONTROL, DIV. OF MARCO SEATTLE, 2300 WEST COMMODORE WAY, SEATTLE, WA 98199, USA) TYPE- BOOK : CHAPTER RDN- 032-0042-3812-4

ON JUNE 3, 1979, THE EXPLORATORY DRILLING RIG, SEDCO 135, HIT A FRACTURED STRATUM WHILE DRILLING AT 3624 M BELOW THE OCEAN FLOOR IN 48 M OF WATER. THIS OIL WELL IS DESIGNATED IXTOC 1, LOCATED 80 KM NW OF CIUDAD DEL CARMEN, MEXICO. AFTER HITTING THE FRACTURED STRATUM, EVENTS LED TO THE UNCONTROLLED OIL BLOWOUT OF THE IXTOC 1 OIL WELL. WITH SEASONAL CURRENT AND WIND PATTERNS PUSHING THE IXTOC 1 OIL NORTHWARD, THE U.S. WAS IMPACTED ALONG THE SOUTHERN TEXAS COAST DURING AUG/SEP, 1979. ON NOV 1, 1979, THE ORE CARRIER MIMOSA WAS HEADING OUT OF THE GALVESTON SHIP CANAL AFTER OFFLOADING ITS CARGO. AT 0500 HOURS LOCAL TIME, THE MIMOSA STRUCK THE 61,674 DWT BURMAH AGATE AMIDSHIPS. BOTH VESSELS IMMEDIATELY CAUGHT FIRE. IT WAS NOT UNTIL MID-JAN, 1980 THAT THE BURMAH AGATE FIRE AND RESULTING OIL SPILL WERE UNDER CONTROL. DURING THE IXTOC 1 AND BURMAH AGATE TANKER SPILL RECOVERY EFFORTS, U.S. NAVY-OWNED MARCO CLASS V AND A MARCO CLASS XI OIL RECOVERY SYSTEM WERE RESPONSIBLE FOR THE MAJOR WATER-BORNE SPILL RECOVERY. THIS PAPER ADDRESSES THE EXPERIENCES INVOLVING THE MARCO OIL SPILL RECOVERY EQUIPMENT DURING THESE TWO SPILLS.

NATIONAL RESPONSE CAPABILITY TO OIL SPILLS: A SYSIEMS APPROACH. /(PRESENTED AT: OCEANS' 80: SEATTLE, WA (USA): 8 SEP 1980). - 81-07 04484

PSARAFTIS, H. N. BAIRD, A. V. NYHART, J. D.

OCEANS '80, OCEANS '80. AN INTERNATIONAL FORUM ON OCEAN ENGINEERING IN THE '80S. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, SEATTLE, WA (USA). PUBL. BY: IEEE: NEW YORK, NY (USA), 1980, P. 407-419. IEEE-80CH1572-7 LANGUAGE(S)- ENGLISH AFFILIATION- (MASSACHUSETTS INST. TECH., CAMBRIDGE, MA 02139, USA) TYPE- BOOK : CHAPTER RDN- 032-0042-3811-2

THIS PAPER DESCRIBES A SYSIEMS APPROACH FOR THE FORMULATION OF THE OVERALL PROBLEM O OIL SPILL POLLUTION RESPONSE IN THE U.S. THE GOAL OF THE PROJECT IS TO CREATE A MODE INTENDED TO BE USED AS A TOOL FOR ANALYSIS OF EXISTING AND ALTERNATIVE SYSIEMS FOR OIL SPILL RESPONSE AND TO PREDICT THE ECONOMIC IMPACT OF VARIOUS RESPONSE OPTIONS. THE PAPER DISCUSSES ALIERNATIVE OBJECTIVES AND PROVIDES A HIERARCHICAL FRAMEWORK FOR DECISIONS FOR OPTIMAL OIL SPILL RESPONSE IN THREE LEVELS, STRATEGIC, TACTICAL AND OPERATIONAL. THE FINANCIAL AND DAMAGE ASSESSMENT ASPECTS OF THE PROBLEM ARE PRESENTED.

AN EXPERIMENTAL EVALUATION OF OIL SPILL COMBUSTION PROMOTERS. /(PRESENTED AT: OCEANS '80: SEATTLE, WA (USA): 8 SEP 1980). - 81-07 04485

TAM, W. K. PURVES, W. F.

OCEANS '80, OCEANS '80. AN INTERNATIONAL FORUM ON OCEAN ENGINEERING IN THE '80S. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, SEATTLE, WA (USA). PUBL. BY: IEEE: NEW YORK, NY (USA), 1980, P. 415-421. IEEE-80CH1572-7 LANGUAGE(S)- ENGLISH AFFILIATION- (ARCTEC CANADA LIMITED, KANATA, ONTARIO, K2K 1Z8, CANADA) TYPE- BOOK : CHAPTER RDN- 032-0042-3810-0

THREE PETROLEUM FRACTIONS WERE BURNED FLOATING ON WATER IN CONFINED AND UNCONFINED LAYERS AT TWO THICKNESSES AND IN VARIOUS WAVE AND ICE CONDITIONS. TEN PROMOTER MATERIALS WERE SCREENED IN AN EFFORT TO IMPROVE THE EASE OF IGNITION AND THE COMPLETENESS OF THE BURNS. THE TEST RESULTS CONTINUE TO SUGGEST THAT IN-SITU BURNING IS A PROMISING OIL SPILL RESPONSE TECHNIQUE.

FEASIBILITY OF WATER SPRAY BARRIERS AS FIREPROOF OIL SLICK CONTAINMENT DEVICES. / PRESENTED AT: OCEANS '80: SEATTLE, WA (USA): 8 SEP 1980). - 81-07 04486

COMFORT, G. MENON, B. PURVES, W. F.

OCEANS '80 -- OCEANS '80. AN INTERNATIONAL FORUM ON OCEAN ENGINEERING IN THE '80S. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, SEATTLE, WA (USA). PUBL. BY: IEEE: NEW YORK, NY (USA), 1980. P. 422-427. IEEE-80CH1572-7. LANGUAGE(S)- ENGLISH AFFILIATION- (ARCTEC CANADA LIMITED, 3-1 LEGGET DR., KANATA, ONTARIO K2K 1Z8, CANADA) TYPE- BOOK : CHAPTER NDN- 032-0042-3809-4

THE SUCCESSFUL USE OF A WATER SPRAY BARRIER AS A HEAT SHIELD IN CONJUNCTION WITH A CONVENTIONAL BOOM FOR IN-SITU BURNING OF OIL SLICKS IS DESCRIBED. FURTHER LABORATORY TEST PROGRAMS TO EVALUATE THE OIL CONTAINMENT CAPABILITIES OF A 'FIXED' WATER SPRAY BARRIER ARE ELABORATED. RESULTS OF TESTING THE DEVICE IN CURRENTS, WINDS AND WAVES, ALONG WITH ITS PERFORMANCE IN COLD ENVIRONMENTS, ARE PRESENTED. IT IS CONCLUDED THAT THE FIXED SPRAY BARRIER TESTED IS CAPABLE OF PERFORMING SATISFACTORILY IN ENVIRONMENTS SPECIFIED FOR CONVENTIONAL BOOMS.

FISHING HARBOR WASTES AND WHAT CAN BE DONE ABOUT THE PROBLEMS. CONFERENCE ON SEAFOOD WASTE MANAGEMENT IN THE 1980'S: ORLANDO, FL (USA): 23 SEP 1980. - 81-07 04415

LANTZ, E. G.

REP. FLA. SEA GRANT PROGRAM. IN: SEAFOOD WASTE MANAGEMENT IN THE 1980'S: CONFERENCE PROCEEDINGS, ORLANDO, FLORIDA, SEPTEMBER 23-25, 1980. OTWELL, W.S. (ED.) PUBL. BY: FLORIDA SEA GRANT COLLEGE: GAINESVILLE, FL (USA). FEB 1981. P. 195-200. FSG-R-40. LANGUAGE(S)- ENGLISH AFFILIATION- (PORT OF BROWNSVILLE PLANNING AND PORT DEVELOP., BROWNSVILLE, TX 78520, USA) TYPE- BOOK : CHAPTER NDN- 032-0042-0606-8

AT THE PORT OF BROWNSVILLE DOMESTIC AND WATER BORNE WASTES INCLUDING BILGE WATERS AR HANDLED THROUGH A COLLECTING SYSTEM THAT EXTENDS TO EVERY LESSEE'S BUILDING AND TO BILGE PUMP-OUT STATION STATIONED AT 100 FEET INTERVALS ALONG THE DOCKS. THREE LIFT STATIONS PICK UP THESE WASTES AND DELIVER THE LIQUID TO A TREATMENT PLANT. THIS PLANT HAS HYDRAWIEVES, OIL SKIMMER, FLOATATION SEPARATION, ALUM, CUASTIC, ACID, POLYMER, AND CHLORINE TREATMENT FACILITIES, AND DELIVERS THE EFFLUENT TO AN 80 ACRE EVAPORATION POND, WITH FLOWS RANGING FROM 40,000 GPD TO 1,100,000 GPD. THIS SYSTEM OPERATES FROM A CONDITION OF BYPASSING THE PLANT AND DELIVERING THE FLOW TO THE POND TO A CONDITION OF FULL CHEMICAL TREATMENT. THE PORT OF BROWNSVILLE FISHING HARBOR IS OPERATED BY ONE GOVERNMENT AGENCY. THIS KEEPS THE POLLUTION AND WASTE DISPOSAL RULES THE SAME FOR ALL PEOPLE DOING BUSINESS AT THE FISHING HARBOR.

U.S. COAST GUARD FAST CURRENT OIL RECOVERY SYSTEM DEVELOPMENT. PRESENTED AT: 16. ANNU. CONF. OF THE MARINE TECHNOLOGY SOCIETY: WASHINGTON, DC (USA): 6 OCT 1980. - 81-0 04193

BECKER, W. W. WARD, J. M.

PROC. ANNU. CONF. MAR. TECH. SOC. IN : MARINE TECHNOLOGY 80. THE DECADE OF THE OCEANS. PROCEEDINGS OF SIXTEENTH ANNUAL CONFERENCE OF THE MARINE TECHNOLOGY SOCIETY, HELD IN WASHINGTON, DC, OCTOBER 6-8, 1980. PUBL. BY: MARINE TECHNOLOGY SOCIETY: WASHINGTON, DC (USA), 1980. P. 150-156. MTS-AC-16. LANGUAGE(S)- ENGLISH AFFILIATION- (US COAST GUARD OFFICE OF RESEARCH AND DEVELOP., WASHINGTON, DC 20593, USA) TYPE- BOOK : CHAPTER NDN- 032-0041-9320-7

THE PAPER REVIEWS WHAT BEGAN AS AN ATTEMPT TO DEVELOP A CAPABILITY TO RECOVER SPILLE OIL FROM REGIONS WHERE WATER CURRENT VELOCITIES EXCEED ABOUT A KNOT-AND-A HALF, REGIONS WHERE CONVENTIONAL BOOMS AND SKIMMERS ARE GENERALLY INEFFECTIVE. THIS PROCES RESULTED IN THE DEVELOPMENT OF THE ZRV (ZERO RELATIVE VELOCITY) SORBENT BELT SKIMMER CONCEPT WHICH PROVIDES THE DESIRED FAST CURRENT OIL RECOVERY CAPABILITY AND ALSO PROMISES HIGH SPEED/HIGH CAPACITY RECOVERY OF OIL SPILLED IN THE PRESENCE OF WAVES TYPICAL OF HARBORS AND BAYS. THE PAPER PROVIDES THE RESULTS OF RECENT TESTS OF THE PROTOTYPE ZRV SKIMMER.

CHEMICAL TREATMENT OF OIL SPILLS. - 81-06 72182

DEWLING, R. T. ; *MCCARTHY, L. T.

ENVIRON. INT., 3(2), 155-162 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (USEPA, 26 FEDERAL PLAZA, NEW YORK, NY 10007, USA) TYPE- JOURNAL ARTICLE: ORIG RESEARCH NDN- 032-0041-0666-9

CHEMICAL TREATMENT METHODS HAVE BEEN USED WITH VARYING DEGREES OF SUCCESS FOR MITIGATING THE ENVIRONMENTAL EFFECTS RESULTING FROM OIL SPILLS. THESE METHODS INCLUD DISPERSING, HERDING, AND GELLING A FLOATING OIL SLICK; SINKING THE OIL; BURNING THE OIL MASS EITHER ON OPEN WATERS OR ON THE AFFECTED SHORELINE; AND APPLYING FILM-FORMING CHEMICAL AGENTS TO PROTECT SHORELINES FROM OIL THAT ELUDES OFFSHORE

CLEANUP. THE LATEST TECHNICAL INFORMATION ON THE APPLICABILITY AND EFFECTIVENESS OF THESE APPROACHES FOR TREATING AND CONTROLLING OIL SPILLS IS PRESENTED.

MINIMIZING THE ECOLOGICAL IMPACTS OF OIL SPILLS. - 81-06 72183

LINDSTEDT SIVA, J.

ENVIRON. INT., 3(2), 185-188 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (SOHIO PETROL. IND.; BIOL. AND ATLANTIC RICHFIELD CO.; 2 S SOUTH FLOWER ST.; LOS ANGELES, 90071, USA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0041-0665-7

TWO OIL SPILL COOPERATIVES ON THE USA WEST COAST ARE IMPLEMENTING PLANS TO MINIMIZE ECOLOGICAL IMPACTS. FIRST, A COASTAL SURVEY WAS CONDUCTED IN THE COOPERATIVE'S AREA OF RESPONSIBILITY. PHYSICAL PROCESSES AND HABITAT TYPES WERE EXAMINED. OIL SPILL CLEANUP GUIDELINES WERE WRITTEN FOR EACH HABITAT TYPE. BIOLOGICALLY SENSITIVE AREAS, THOSE SITES MOST VULNERABLE TO OIL SPILL IMPACTS, WERE IDENTIFIED. STRATEGIES WERE DEVELOPED TO PROTECT MOST SENSITIVE AREAS, I.E., PREVENT SPILLED OIL FROM REACHING THEM. PROTECTION IS THE PREFERRED OPTION BECAUSE IT PREVENTS BOTH THE IMPACT OF THE OIL AND SUBSEQUENT CLEANUP ACTIVITIES. PROTECTED AREAS CAN OFTEN SERVE AS REPOPULATION CENTERS FOR SURROUNDING SITES THAT MAY HAVE BEEN IMPACTED.

ARTIFICIAL LIFT CONCEPTS AND TIMING. - 81-06 72272

BENNETT, P.

PET. ENG. INT., 52(6), 144;148;152;154;156;160;162 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (KEPLINGER AND ASSOCIATES INC.; DALLAS, TX, USA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0041-0576-8

SELECTING THE BEST TIME TO INSTAL ARTIFICIAL LIFT IS A TOUGH DECISION, AND ESCALATING OIL PRICES ARE CHANGING CERTAIN PREVIOUSLY ACCEPTED PRACTICES. OPERATING PRACTICES, ABANDONMENT WATER CUT, WELL SPACING, CAPACITY OF LIFT SYSTEM, SEPARATOR PRESSURE, ETC. ALL CONTRIBUTE TO THE DECISION-MAKING PROCESS. INITIAL EQUIPMENT COST, PRESENT AND PREDICTED FUTURE, MUST ALSO BE CONSIDERED. THIS ARTICLE ATTEMPTS TO PLACE THESE AND OTHER GENERAL GUIDELINES IN PROPER CONTEXT AND RELATE THEM TO APPLICATION OF ARTIFICIAL LIFT IN A GIVEN FIELD SITUATION. OVERALL ARTIFICIAL LIFT GUIDELINES MAY BE BROKEN DOWN INTO TWO MAIN AREAS: THE TIMING OF ARTIFICIAL LIFT, AS RELATED TO OTHER OPTIONS FOR INCREASING OR MAINTAINING PRODUCING CAPACITY AND TO MEET RESERVOIR MANAGEMENT GOALS; AND LOGICAL ARTIFICIAL LIFT CONCEPTS, ONCE THE OPERATOR DETERMINES THAT SOME TYPE OF LIFT IS REQUIRED.

NORTH SEA OPERATORS FACE VARIED PROBLEMS. - 81-06 03521

BLEAKLEY, W. B.

PET. ENG. INT., 52(12), 26 (1980) LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE: REVIEW NDN- 032-0040-9057-1

THREE ARTICLES ILLUSTRATE DIFFERENT MECHANICAL AND PHILOSOPHICAL APPROACHES TO FIELD EXPLOITATION BY OPERATORS. CONOCO NORTH SEA, FOR EXAMPLE, OPTED TO INSTALL THE WORLD'S FIRST TENSION-LEG PLATFORM TO DEVELOP THE HUTTON FIELD. SOME WELLS WILL BE DRILLED THROUGH AN OCEAN-FLOOR TEMPLATE BEFORE THE PLATFORM IS FLOATED INTO POSITION. THE FIRST ARTICLE FOCUSES ON THE NEED TO MAINTAIN TOTAL WEIGHT WITHIN SPECIFIED LIMITS, AND TO ENSURE THAT THIS WEIGHT IS DISTRIBUTED ACCORDING TO PLAN TO KEEP THE CENTER OF GRAVITY LOCATION WITHIN TOLERANCE. TEXACO NORTH SEA UK LTD. IS USING A MORE OR LESS CONVENTIONAL PLATFORM TO DEVELOP ITS TARTAN FIELD, BUT THAT PLATFORM HAS ONE UNIQUE FEATURE: IT WAS FABRICATED IN TWO MAJOR SECTIONS IN TWO DIFFERENT COUNTRIES. MATING THE TWO SECTIONS WAS NO PROBLEM AND INSTALLATION WENT SMOOTHLY. BUT TEXACO IS CONCERNED ABOUT RESERVOIR PROBLEMS RELATIVE TO WATER INJECTION. OTHER OPERATORS HAVE NOTED ERRATIC BEHAVIOR OF INJECTION PRESSURES AND RATES, AND TEXACO FEELS THIS IS DUE TO MOBILE FINES IN THE RESERVOIR WHICH START MIGRATING UNDER HIGH FLUID VELOCITIES IN THE RESERVOIR ACCOMPANYING HIGH WATER-INJECTION RATES. THE SECOND ARTICLE COVERS TEXACO'S APPROACH TO THIS PROBLEM, TO ASSURE GOOD WATER INJECTION AND SUCCESSFUL PRESSURE MAINTENANCE. THE THIRD ARTICLE DEALS WITH THE UNIQUE RESERVOIR FLUID IN MARATHON OIL UK LTD.'S BRAE FIELD. THE ELUSIVE BRAE RESERVOIR WAS HARD TO DELINEATE BECAUSE OF ITS UNUSUAL SHAPE, COMPLICATED BY NUMEROUS SEALING ADULTS, BUT THE GREATEST PROBLEM FACING MARATHON IS COPING WITH THE RELATIVELY HIGH CARBON DIOXIDE CONTENT OF THE RESERVOIR FLUIDS. IN SOLUTION IN THE RESERVOIR, THE CO 2 COMES OFF EASILY IN THE SEPARATORS AND MAKE UP 35% OF THE STREAM GAS.

OWNERS FIGHT POLLUTION. - 81-05 03223

MAR. ENG./LOG., 85(13), 40-43 (1980) LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE: REVIEW NDN- 032-0040-4116-0

THE AUTHOR DESCRIBES THE FUNCTION OF THE INTERNATIONAL TANKER OWNERS POLLUTION FEDERATION (ITOPF), FOUNDED IN 1968 LARGELY IN RESPONSE TO THE TORREY CANYON DISASTER IN 1967, WHICH HAD DEMONSTRATED THE INADEQUACIES OF EXISTING ARRANGEMENTS

FOR THE PROVISION OF COMPENSATION AFTER OIL SPILLS. APART FROM COMPENSATION, THE KEY FUNCTION OF ITOPF IS TO PROVIDE ADVICE ON CLEAN-UP OPERATIONS AFTER MAJOR OIL SPILLS. THE VARIOUS METHODS USED ARE DISCUSSED. A RECENT REPORT BY THE FEDERATION FOR THE BE RECOMMENDED THE FOLLOWING: (1) ESTABLISHMENT OF DATA ON OIL PROPERTIES; (2) FORMAL EQUIPMENT INVENTORY WORLDWIDE; (3) BETTER TRAINING FOR OPERATION PERSONNEL; (4) EXCHANGE OF INFORMATION BETWEEN COUNTRIES ON SPILL EXPERIENCE; (5) INTERNATIONAL TESTING AND STANDARDIZATION OF EQUIPMENT.

PERFORMANCE OF SOME OIL DISPERSANTS ON OIL SLICKS OF VARYING THICKNESS. - 81-05 66201

MEEKS, D. G.

MAR. POLLUT. BULL., 11(12), 348-352, (1980). LANGUAGE(S)- ENGLISH. AFFILIATION- (BRITISH PETROLEUM CO. LTD., BP RES. CENT., CHERTSEY ROAD, SUNBURY-ON-THAMES, MIDDLESEX, UK). TYPE- JOURNAL ARTICLE: ORIG. RESEARCH. NDN- 032-0040-0829-5

LABORATORY TESTS HAVE SHOWN THAT THICKER LAYERS (UP TO 2 CM THICK) OF (HEAVY) SPILLE OILS CAN BE SUCCESSFULLY TREATED WITH CURRENTLY AVAILABLE OIL SPILL DISPERSANTS PROVIDED CERTAIN CRITERIA RELATING TO SOAKING TIME OR THOROUGH MIXING OF OIL WITH DISPERSANT CAN BE MET.

CLEAN-UP OF OIL POLLUTION AT SEA. ((PRESENTED AT: EUROPEC '80: EUROPEAN OFFSHORE PETROLEUM CONFERENCE AND EXHIBITION; LONDON (UK); 21 OCT 1980). - 81-05 03277

MORRIS, P. R.

IN: EUROPEC '80: EUROPEAN OFFSHORE PETROLEUM CONFERENCE AND EXHIBITION, PROCEEDINGS VOLUME I. EUROPEAN OFFSHORE CONFERENCE AND EXHIBITION, LONDON (UK); SOCIETY OF PETROLEUM ENGINEERS (U.K.) LTD., LONDON (UK). PUBL. BY: EUROPEAN OFFSHORE CONFERENCE AND EXHIBITION/SOCIETY OF PETROLEUM ENGINEERS (U.K.) LTD.; LONDON (UK). 1980. VOL.1, P.141-148. EUR 161. LANGUAGE(S)- ENGLISH. AFFILIATION- (WARREN SPRING LAB., STEVENAGE, HERTS., UK). TYPE- BOOK : CHAPTER. NDN- 032-0040-0149-5

THE AVAILABLE METHODS FOR THE CLEAN-UP OF OIL (AND CERTAIN CHEMICAL) SPILLS AT SEA ARE CONSIDERED AND RECENT DEVELOPMENTS IN TWO FIELDS NAMELY, DISPERSANT APPLICATION AND OIL RECOVERY, COVERED IN DETAIL. THE APPLICATION OF DISPERSANTS IS SHOWN TO BE RESTRICTED BY THE VISCOSITY OF THE OIL ON THE WATER WHICH INCREASES RAPIDLY DUE TO OIL IN WATER AND EMULSION FORMATION. SAMPLES OF OIL EMULSION RECOVERED OF THE WATER CAN SHOW POOR RESPONSE TO DISPERSANTS WHEN THE VISCOSITY INCREASES TO ABOUT 7 500-10 000 CP DEPENDING ON THE DISPERSANT USED AND THE NATURE OF THE CRUDE OIL. DIFFERENCES IN DISPERSANT PERFORMANCE CAN BE SHOWN BY USE OF A LABORATORY TEST. THE DEVELOPMENT AND LIMITATIONS OF RECOVERY SYSTEMS ARE CONSIDERED WITH REFERENCE TO THE SPRINGSWEEP SYSTEM. MENTION IS MADE TO NETTING SYSTEMS FOR USE WITH OILS WHICH ARE SEMI SOLID ON THE SURFACE OF THE WATER.

CATALOGUE OF FRENCH MEANS OF COMBATTING OIL SPILLS AT SEA. - 81-05 00718

PUBL. BY: ASTEO; PARIS (FRANCE), 1980, 75 P. LANGUAGE(S)- ENGLISH, FRENCH. CORP. AUTH- ASSOCIATION SCIENTIFIQUE ET TECHNIQUE POUR L'EXPLOITATION DES OCEANS, PARIS (FRANCE). TYPE- REPORT. NDN- 032-0039-9721-0

THIS CATALOGUE PRESENTS THE FRENCH FIRMS WORKING IN OIL POLLUTION CONTROL AND THEIR PRODUCTS: BOOMS, SKIMMERS, DISPERSANTS, ABSORBANT, IMPACT STUDIES.

(CLEANING SURFACE WATERS). - 81-05 63023

CLEYET MERLE, C.

TECH. SCI. MUNIC., (NO. 2), 47-58, (1980). LANGUAGE(S)- FRENCH. AFFILIATION- (ALSTHOM-ATLANTIQUE, SERV. TRAITEMENT DE LA POLLUTION, NEYRTEC, FRANCE). TYPE- JOURNAL ARTICLE: ORIG. RESEARCH. NDN- 032-0039-7505-6

THE EXISTING EQUIPMENT FOR RECOVERING FLOATING WASTE SOLIDS ARE REVIEWED. BEFORE OIL POLLUTION CONTROL EQUIPMENTS, THE FOLLOWING POINTS ARE ALSO EXAMINED: POSSIBILITIES FOR STOCKING RECOVERED HYDROCARBONS, FLOATING DAMS, MECHANICAL RECOVERY IN A RIVER O NEAR THE COASTS, RECOVERY OFFSHORE IN STORM-WATER BASINS AND INDUSTRIAL BASINS.

COMPUTER MODEL WILL AID OIL SPILL CLEANUP EFFORTS. - 81-05 02811

PAGE, D. G.

SEA TECHNOL., 21(9), 10-12, (1980). LANGUAGE(S)- ENGLISH. AFFILIATION- (MIT, SEA GRANT COLL. PROGRAM, CAMBRIDGE, MA 02139, USA). TYPE- JOURNAL ARTICLE : REVIEW. NDN- 032-0039-7235-3

A TWO-YEAR RESEARCH PROGRAM SPONSORED BY THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

(MIT) SEA GRANT COLLEGE PROGRAM IS CREATING POLICY TOOLS FOR ASSESSING OIL SPILL DAMAGES AND CLEANUP COSTS. THE RESULTING COMPUTER MODELS SHOULD PROVIDE NEW INFORMATION ON REAL COSTS OF SPILLS, WHO PAYS, AND OPTIMUM STRATEGIES TO PREVENT MINIMIZE THE EFFECTS OF FUTURE SPILLS.

ANNOUNCING A BOOM IN OIL RECOVERY. - 81-05 02839

NEW SCIENTIST 89(1243), 605 (1981) LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE : REVIEW NDN- 032-0039-7207-9

A BRITISH PETROLEUM PROTOTYPE COLLECTED 7500 TONNES OF OIL PER DAY IN WINDS UP TO KNOTS AND WAVES UP TO 3 M. WEIR BOOMS, PLUS CONVENTIONAL CONTAINMENT BOOMS IN A W-CONFIGURATION ALLOW A TEAM TACKLING OIL-SPILLS ALLOW A TEAM TACKLING OIL-SPILLS COLLECT UP TO 15 000 TONNES PER DAY.

SAVING OIL TO SALVE CONSCIENCE. - 81-05 02844

SHIPP. WORLD SHIPBUILD. 174(3968), 497 (1980) LANGUAGE(S)- ENGLISH TYP JOURNAL ARTICLE : REVIEW NDN- 032-0039-7202-0

IN CONFINED WATERS, THE USE OF CONTAINMENT BOOMS IS PARTICULARLY VITAL, AND THE EFFECTIVENESS OF THESE DEVICES HAS BEEN DEMONSTRATED IN SEVERAL SALVAGING OPERATIO IN RECENT MONTHS, REVIEWED HEREIN.

OPERATING EXPERIENCE WITH COAST GUARD POLLUTION EQUIPMENT IXTOC 1. // (PRESENTED A 16. ANNU. CONF. OF THE MARINE TECHNOLOGY SOCIETY: WASHINGTON, DC (USA): 6 OCT 1980). 81-05 03158

MARCOLINI, R. A. O'BRIEN, J. L. DOHERTY, C. B. SIMPSON, M. H.

PROC. ANNU. CONF. MAR. TECH. SOC. IN: MARINE TECHNOLOGY 80. THE DECADE OF THE OCEANS. PROCEEDINGS OF SIXTEENTH ANNUAL CONFERENCE OF THE MARINE TECHNOLOGY SOCIET HELD IN WASHINGTON, DC OCTOBER 6-8 1980. PUBL. BY: MARINE TECHNOLOGY SOCIETY: WASHINGTON, DC (USA). 1980. P. 137-145. MTS-AC-16. LANGUAGE(S)- ENGLISH AFFILIATION- (U.S. COAST GUARD, WASHINGTON, DC 20593, USA) TYPE- BOOK : CHAPTER NDN- 032-0039-6914-7

THIS PAPER INITIALLY DESCRIBES THE U.S. COAST GUARD'S PRIMARY TOOL FOR RESPONDING T MAJOR OPEN OCEAN OIL SPILLS, THE SKIMMING BARRIER SYSTEM. THE DAY-TO-DAY EXPERIENCE OF THE NATIONAL STRIKE FORCE IN DEPLOYING AND OPERATING THE SYSTEM AT IXTOC 1 ARE THEN RELATED. THE PROBLEMS ENCOUNTERED DURING THE OPERATION ARE DETAILED AND THE PERFORMANCE OF THE SKIMMING BARRIER SYSTEM IS DISCUSSED.

AMINE CARBAMATE GELLING AGENTS FOR FACILITATING OIL SPILL RECOVERY AND CONTROL. PRESENTED AT: 16. ANNU. CONF. OF THE MARINE TECHNOLOGY SOCIETY: WASHINGTON, DC (USA) OCT 1980). - 81-05 03159

BANNISTER, W. W. RANCOURT, J. D. CURBY, W. A. FRANK, U. AGUILAR, C.

PROC. ANNU. CONF. MAR. TECH. SOC. IN: MARINE TECHNOLOGY 80. THE DECADE OF THE OCEANS. PROCEEDINGS OF SIXTEENTH ANNUAL CONFERENCE OF THE MARINE TECHNOLOGY SOCIETY HELD IN WASHINGTON, DC OCTOBER 6-8 1980. PUBL. BY: MARINE TECHNOLOGY SOCIETY: WASHINGTON, DC(USA). 1980. P. 146-149. MTS-AC-16. LANGUAGE(S)- ENGLISH AFFILIATION- (LOWELL UNIV., DEP. CHEM., LOWELL, MA 01854, USA) TYPE BOOK : CHAPTER NDN- 032-0039-6913-5

RECOVERY OF SPILLED OIL ON WATER SURFACES IS VERY DIFFICULT WHEN THE SPILL IS IN WATERS INACCESSIBLE TO CONVENTIONAL CLEAN-UP EQUIPMENT. IN THE MOST IDEAL SITUATIONS COMPLETE RECOVERY IS UNATTAINABLE DUE TO THE SPREAD OF UNHARVESTED OIL OVER THE PREVIOUSLY CLEANED. THIS PAPER DESCRIBES A TECHNIQUE INVOLVING TRANSFORMATION OF THE LIQUID OIL INTO A GEL BY USE OF DEHYDRO-ABIETYLAMINE AND CARBON DIOXIDE TO FORM A CARBAMATE SALT. DEVELOPMENT OF THE GELATION TECHNIQUE AND RESULTS OF FIELD TESTS AT EPA FACILITIES AT EDISON, NJ AND LEONARDO, NJ, AND AT THE U.S. NAVAL SUBMARINE BASE AT NEW LONDON, CT ARE DISCUSSED. THESE TESTS INVOLVED USE OF MODULAR REAGENT APPLICATION DEVICES, AND THE RECOVERY OF GELLED OIL AND SEPARATION OF THIS INTO ITS ORIGINAL COMPONENTS FOR REUSE.

INTERDISCIPLINARY PANEL STATEMENTS, ENGINEERING INTERACTIONS. // (PRESENTED AT: INTERNATIONAL WORKSHOP ON THE SEASONAL SEA ICE ZONE: MONTEREY, CA (USA): 26 FEB 1979). 81-05 00161

COX, G. F. N.

COLD REG. SCI. TECHNOL. 2, 342-354 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (OCEANOGR. SERVICES, INC., SANTA BARBARA, CA, USA) TYPE- JOURNAL ARTICLE : DISCUSSION NDN- 032-0039-3789-4

INFORMATION OF THE ENVIRONMENTAL CONDITIONS AND THE ENGINEERING PROBLEMS THAT OCCUR

CLEANING AGENTS WERE TOXIC TO THE BIRDS. MOST DETERGENTS LEFT A SURFACTANT (WETTING AGENT) ON THE FEATHERS WHICH RESULTED IN SUBSEQUENT WETTING OF RELEASED BIRDS. ALTHOUGH REHABILITATION TECHNIQUES HAVE IMPROVED IN RECENT YEARS, HIGH BIRD MORTALI CAN BE EXPECTED FOLLOWING FUTURE OIL SPILLS.

DISPOSAL TECHNIQUES FOR SPILT OIL. - 81-04 00566

OUDENHOVEN, J. A. C. M. VAN ANGLES, M. DE ROOCKER, A. KELLY, R. P. LOUDEN, W. L RUDD, J. K. LEVI, J. D.

CONCAWE REP. (NO. 9/80) PUBL. BY: CONCAWE: GRAVENHAGE (NETHERLANDS) OCT 1980. 58 P. LANGUAGE(S)- ENGLISH TYPE- REPORT NDN- 032-0038-9132-8

THE VARIOUS TECHNIQUES WHICH CAN BE USED TO DISPOSE OF OIL AND OILY DEBRIS COLLECT AFTER MAJOR OIL SPILLS ARE DESCRIBED. THE REPORT IS INTENDED TO ASSIST INDIVIDUALS AND ORGANISATIONS CONCERNED WITH THIS PROBLEM, INCLUDING: NATIONAL AND LOCAL AUTHORITIES; COMPILERS OF CONTINGENCY PLANS; MANAGERS OF DISPOSAL ORGANISATIONS; O SPILL CLEAN-UP SUPERVISORS; INDUSTRY PERSONNEL. THE NATURE OF THE COLLECTED MATERIA ITS TRANSPORTATION AND STORAGE IS OUTLINED. THE DISPOSAL TECHNIQUES WHICH ARE DESCRIBED RESULT (IN ORDER OF PREFERENCE) IN: RECOVERY OF OIL FOR RE-USE OR STABILISATION OF THE OILY WASTE, OR DESTRUCTION OR DECOMPOSITION OF THE OIL. RECOVE TECHNIQUES INCLUDE GRAVITY SEPARATION, EMULSION-BREAKING AND A VARIETY OF WASHING OF EXTRACTION PROCEDURES. OILY WASTE MAY BE STABILISED THROUGH USE IN CIVIL WORKS OR B A RANGE OF LANDFILL PROCEDURES. DESTRUCTIVE TECHNIQUES INCLUDE BIOLOGICAL DEGRADATIO OR HEAT TREATMENT (WHICH MAY PERMIT HEAT RECOVERY). SOME INDICATION OF MANPOWER REQUIREMENTS AND COSTS IS GIVEN, TOGETHER WITH A 'DESIRABILITY RATING' FOR THE VARIOUS METHODS OF DISPOSAL. ALTHOUGH FINAL CHOICE OF DISPOSAL METHOD WILL ALWAYS DEPEND ON LOCAL CONDITIONS AND THE LEGAL CONSTRAINTS OF EACH CASE, CLOSE CO-OPERATIO IS URGED BETWEEN AUTHORITIES AND INDUSTRY, BEFORE, DURING AND AFTER AN OIL SPILL, TO ENSURE THAT COLLECTED OIL IS DISPOSED OF IN AN ENVIRONMENTALLY ACCEPTABLE, COST-EFFECTIVE AND ENERGY-CONSERVING MANNER. RECOMMENDATIONS ARE MADE FOR FUTURE DEVELOPMENTS IN SPILT OIL DISPOSAL TECHNIQUES.

AN OILSPILL IN PACK ICE. - 81-03 00488

C-CORE PUBL. (NO. 80-2) JAN 1980. 248 P. REQUEST FOR COPIES TO: S.L. ROSS, ENVIRON. EMERGENCY BRANCH, ENVIRON. CAN., 15TH FLOOR, VINCENT MASSEY, OTTAWA, CANADA K1A 1C8. LANGUAGE(S)- ENGLISH, POLISH CORP. AUTH- MEMORIAL UNIV OF NEWFOUNDLAND, ST. JOHN'S (CANADA). CENT. FOR COLD OCEAN RESOURCES ENGINEERING. TYPE- REPORT NDN- 032-0038-3386-9

ABOUT 1100 TONNES OF OIL FROM THE KURDISTAN WAS ENTRAINED IN PACK ICE OFF THE CAPE BRETON COAST. THE OIL, WHICH WAS BELOW ITS POUR POINT AT THE PREVAILING SEASONAL TEMPERATURES, WAS DISTRIBUTED IN STREAKS AND PATCHES AS A FINE PARTICULATE DISPERSIO IN THE ICE. OIL CONCENTRATIONS WERE AS HIGH AS 200 PPM IN HEAVILY CONTAMINATED AREAS ONLY A SMALL FRACTION OF THE OIL-CONTAMINATED ICE WAS DEPOSITED ALONG SHORELINES. MOST OF THE SHORELINE CONTAMINATION IN THE AREA STUDIED OCCURRED AFTER THE ICE PACK HAD DISPERSED OR MELTED. A VARIETY OF OILSPILL DETECTION AND TRACKING TECHNIQUES WER EVALUATED. IRION SPILL TRACKING BUOYS WERE VERY SUCCESSFUL. REMOTE SENSING TECHNIQUE RELYING ON HIGH ALTITUDE PASSIVE IMAGING SYSTEMS WERE NOT RELIABLE. POSITIVE IDENTIFICATION OF OIL CONTAMINATION WAS ONLY POSSIBLE UNDER CERTAIN ICE CONDITIONS. SLICK TRAJECTORY MODELLING TECHNIQUES WERE NOT ABLE TO COPE WITH ICE CONDITIONS. NOR WERE THEY HIGHLY SUCCESSFUL IN PREDICTING OPEN WATER TRAJECTORIES DUE TO A LACK OF ADEQUATE CURRENT DATA. THERE IS NO EXISTENT CLEANUP TECHNOLOGY WHICH COULD SUCCESSFULLY COPE WITH OIL-ICE MIXTURES OF THE TYPE OBSERVED. IT IS EXPECTED THAT SIMILAR CONDITIONS WOULD RESULT FROM A CRUDE OIL SPILL IN PACK ICE. AN ACTIVE PROGRA OF COUNTERMEASURES RESEARCH AND DEVELOPMENT IS RECOMMENDED.

(PHYTOCOENOLOGICAL SURVEY OF THE AMOCO CADIZ OIL SPILL EFFECTS ON THE SALT MARSHES OF THE NORTHERN COAST OF BRITTANY). - 81-03 00541

GEHU, J. M.

PUBL. BY: INSTITUT EUROPEEN D'ECOLOGIE: LILLE (FRANCE) APR 1979. 20 P. CONTRACT CNEXO 78/5753. LANGUAGE(S)- FRENCH AFFILIATION- (INST. EUROPEEN D'ECOL., LILLE, FRANCE) TYPE- REPORT NDN- 032-0038-3333-0

ALL THE SALT MARSHES OF THE NORTHERN COAST OF BRITTANY HAVE BEEN POLLUTED BY THE AMOCO CADIZ OIL SPILL; GUISSENY AND ILE GRANDE WERE THE MOST POLLUTED. NO SPECIES HAS DISAPPEARED, AND VEGETATION HAS COMPLETELY RECOVERED IN 1980. THREE SPECIES WERE VERY TOLERANT: JUNCUS MARITIMUS, LIMONIUM VULGARE, TRIGLOCHIN MARITIMUM. CLEANING TREATMENTS STERILIZE THE SOIL AND ARE MORE POLLUTING THAN THE OIL SPILL.

DIFFERENCES IN THE EFFECTS OF FUEL OIL, AN OIL DISPERSANT AND THREE POLYCHLORINATED BIPHENYLS ON FIN REGENERATION IN THE GULF COAST KILLIFISH, FUNDULUS GRANDIS . - 81-03 49843

FINGERMAN, S. W.
BULL. ENVIRON. CONTAM. TOXICOL., 25(2), 234-240, (1980). LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. BIOL., TULANE UNIV., NEW ORLEANS, LA 70118, USA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0037-9099-8

FEMALE F. GRANDIS WERE INTUBATED WITH A SINGLE DOSE OF ONE OF A NUMBER OF AROCLOR FORMULATIONS WITH AND WITHOUT FUEL OIL. THE PCB WITH FUEL OIL AND FUEL OIL ALONE CAUSED CONSIDERABLE INHIBITION OF FIN REGENERATION FROM 14 DAYS ONWARDS. IN FURTHER EXPERIMENTS THE OIL DISPERSANT BP 1100X WAS GIVEN SINGLY AND IN COMBINATION WITH AROCLOR 1268 AND FUEL OIL. BP 1100X WITH FUEL OIL INHIBITED FIN REGENERATION FOR THE FIRST 21 DAYS. SOME DIFFERENCES WERE SEEN ACCORDING TO THE TIME OF YEAR AT WHICH THE EXPERIMENT WAS CARRIED OUT. AROCLOR 1268 WITH FUEL OIL IN THE AUTUMN RESULTED IN STIMULATION RATHER THAN THE INHIBITION OF REGENERATION SEEN IN SPRING. THE RESULTS HIGHLIGHT THE COMPLEXITY OF PROBLEMS WITH COMPOUNDS THAT INTERACT AND THE SEASONAL DIFFERENCES IN THE EFFECTS OBSERVED.

CHANGES IN THE RESPIRATION AND BLOOD CIRCULATION OF COD, GADUS MORHUA L., INDUCED BY EXPOSURE TO POLLUTANTS. - 81-03 00717

JOHNSTONE, A. D. F. HAWKINS, A. D.

SCOTT. FISH. RES. REP., (NO. 18) PUBL. BY: DEPARTMENT OF AGRICULTURE AND FISHERIES FOR SCOTLAND: ABERDEEN (UK), 1980. 40 P. LANGUAGE(S)- ENGLISH AFFILIATION- (MAR. LAB., P.O. BOX 101, VICTORIA RD., TORRY, ABERDEEN, UK) TYPE MONOGRAPHIC SERIES NDN- 032-0037-8111-0

CHANGES IN HEART RATE, GILL VENTILATION RATE AND OXYGEN CONSUMPTION WERE EVIDENT ON EXPOSURE OF G. MORHUA TO CRYOLITE RECOVERY SLUDGE (ALUMINIUM SMELTER WASTE), A SOLUTION OF AN OIL DISPERSANT (BP 1100 WD), CRUDE OIL FROM THE NORTH SEA, AND A MIXTURE OF OIL AND DISPERSANT IN SEA WATER. COUGHING WAS ELICITED ON EXPOSURE TO A DILUTION OF WHOLE CRYOLITE RECOVERY SLUDGE. GILL VENTILATION RATE INCREASED DRAMATICALLY WHEN THE FISH WERE EXPOSED TO OIL, DISPERSANT AND AN OIL/DISPERSANT MIXTURE. SIGNIFICANT CHANGES IN THE PARAMETERS MONITORED DID NOT OCCUR UNTIL POLLUTANT CONCENTRATIONS WERE CLOSE TO LETHAL LEVELS.

OIL-SPILL CHEMICALS. A BIBLIOGRAPHY ON THE NATURE, APPLICATION, EFFECTS AND TESTING OF CHEMICALS USED AGAINST OIL SPILLED IN THE MARINE ENVIRONMENT. - 81-02 00345

NELSON SMITH, A.

PUBL. BY: INTERNATIONAL PETROLIUM INDUSTRY ENVIRONMENTAL CONSERVATION ASSOCIATION: LONDON (UK), 1 JUN 1980. 87 P. ISBN 0-907252-01-X LANGUAGE(S)- ENGLISH AFFILIATION- (UNIV. COLL., SWANSEA, INST. MAR. STUD., SWANSEA, UK) TYPE- BOOK : MONOGRAPH NDN- 032-0037-1775-4

ALL RECENT PUBLICATIONS ON OIL SPILL CHEMICALS ARE LISTED IN THIS BIBLIOGRAPHY: REFERENCES PRIOR TO THE LATE 1960S WERE CRITICALLY SCREENED BEFORE INCLUSION. THE MAIN BIBLIOGRAPHY IS ARRANGED IN ALPHABETICAL CHRONOLOGICAL ORDER. THE MORE SPECIALIST OR DETAILED PUBLICATIONS ARE LISTED UNDER KEY CATEGORIES, AFTER THE MAIN ENTRIES.

(MARINE OIL POLLUTION. INTERNATIONAL CONFERENCE. BREST. MARCH 28-29-30 1979). - 81-02 00172

PUBL. BY: MAIRIE DE BREST: BREST (FRANCE), 1980. 227 P. LANGUAGE(S)- FRENCH CORP. AUTH- UNION DES VILLES DU LITORAL OUEST-EUROPEEN. TYPE- BOOK : CONFERENCE PROCEDDINGS NDN- 032-0037-1748-1

A YEAR AFTER THE AMOCO CADIZ OIL SPILL, THE UNITED TOWNS OF THE WEST EUROPEAN COAS ORGANIZED THIS SYMPOSIUM, WHICH WAS A DISCUSSION ON ACCIDENTAL OIL SPILLS, THE NAVIGATION RULES AND ACCIDENTS PREVENTION, ON POLLUTION CONTROL (OIL REMOVAL AND WASTES TREATMENT) ON OIL SPILLS ECOLOGICAL IMPACT AND THEIR ECONOMICAL AND SOCIAL CONSEQUENCES. DIFFERENT POINTS OF VIEW ON LEGISLATIVE ASPECTS AND CONTINGENCY PLANS WERE GIVEN.

(OIL SKIMMERS). - 81-02 00418

PEIGNE, G.

PUBL. BY: CEDRE: BREST (FRANCE), MAY 1980. 30 P. CEDRE R-80-143-F-GP/MT. LANGUAGE(S)- FRENCH AFFILIATION- (CENT. DE DOCUMENTATION DE RECHERCHE ET D'EXPERIMENTATION SUR LES POLLUTIONS ACCIDENTELLES DES EAUX, 16 QUAI DE LA DOUANE, 29200 BREST, FRANCE) TYPE- REPORT NDN- 032-0037-1708-0

A REVIEW IS GIVEN OF THE EXISTING INSTRUMENTS FOR OIL REMOVAL. NEEDS AND CHOICE CRITERIA ARE DEFINED. THE MOST REPRESENTATIVE SYSTEMS ARE PRESENTED AND CLASSED IN TWO TYPES: THE MECHANICAL SKIMMERS, AND THE OLEOPHILIC ONES. THE EXISTING INSTRUMENT GIVEN SATISFACTION WHEN THE WEATHER CONDITIONS ARE GOOD, BUT THERE ARE NO GOOD SKIMMERS FOR HIGH SEAS IN ROUGH CONDITIONS.

OIL SPILL SKIMMER SPEEDS RECOVERY. - 81-02 01522

OFFSHORE, 40(5), 327 (1980) ISSN: 0030-0608 LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE : REVIEW NDN- 032-0036-8647-2

THE ARTICLE DESCRIBES A NEW TYPE OF OIL SPILL SKIMMER, THE CLASS XI SKIMMER, WHICH SUCCESSFULLY COMPLETED AN OIL RECOVERY ASSIGNMENT RECENTLY WHEN THE LIBERIAN TANKER BURMAH AGATE STARTED BURNING AND SPILLING OIL IN NOVEMBER 1979 FOLLOWING A COLLISION AT SEA NEAR GALVESTON BAY, TEXAS, WHILE PREVIOUS OPEN-WATER SKIMING EQUIPMENT REVOLVED AROUND A COSTLY SINGLE-PURPOSE RECOVERY VESSEL, THE NEW SYSTEM READILY CONVERTS ANY AVAILABLE VESSEL WITH ADEQUATE TANK CAPACITY INTO AN OIL SPILL RECOVERY VESSEL.

STATE OF THE ART IN HIGH SEA-STATE OIL POLLUTION RESPONSE CAPABILITIES. - 81-02 00081

BEACH, R. L.

ENVIRON. INT., 3(2), 171-176 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (SEAWARD INT., INC., FALLS CHURCH, VA 22044, USA) TYPE- JOURNAL ARTICLE : DISCUSSION NDN- 032-0035-8790-1

THIS PAPER DESCRIBES THE APPROACHES TO DEALING WITH A TANKER STRANDING WHERE THE OIL IS STILL CONTAINED WITHIN THE TANKS, AND AN ACTUAL SPILLAGE FROM A DAMAGED TANKER OR FIXED SOURCE. IN THE STRANDING CASE, THE CARGO OFF-LOADING APPROACH IS COMPARED WITH CARGO JETTISONING (PUMPING PART OF THE CARGO OVERBOARD) AND STABILIZATION APPROACHES IN THE SPILLAGE CASE, THE BASIC APPROACHES THAT ARE FEASIBLE ARE SKIMMING AND THE USE OF DISPERSANTS. THE ADVANTAGES OF EACH ARE DISCUSSED. SYSTEMS INCLUDING LARGE CONTAINMENT BARRIERS ARE ESTIMATED TO BE LESS EFFECTIVE THAN DIRECT-ACTING SKIMMERS BECAUSE OF THE OPERATIONAL CONTROL PROBLEMS IN HIGH SEA STATES. EFFECTIVE DIRECT-ACTING SKIMMERS ARE NOT IN WIDE-SPREAD USE AT PRESENT, ALTHOUGH SEVERAL SYSTEMS ARE UNDER DEVELOPMENT. DISPERSANT SYSTEMS ARE ESTIMATED TO HAVE THE HIGHEST SEA-STATE OPERATING CAPABILITY, PARTICULARLY AIRCRAFT-APPLICATION SYSTEMS, WHICH COULD BE EFFECTIVE IN CONDITIONS UP TO WHERE A SLICK IS RAPIDLY DISPERSED THROUGH NATURAL WAVE TURBULENCE.

CHEMICAL CHARACTERISTICS OF SOME INDIGENOUSLY MANUFACTURED OIL DISPERSANTS. - 81-01 24191

SOLIMABI TOPGI, R. S.

INDIAN J. MAR. SCI., 7(3), 203-205 (1978) LANGUAGE(S)- ENGLISH AFFILIATION (NATL. INST. OCEANOGR., DONA PAULA, GOA 403004, INDIA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0035-4949-3

FOUR OIL DISPERSING CHEMICALS, INDIGENOUSLY MANUFACTURED, HAVE BEEN ANALYSED FOR THE ACTIVE FUNCTIONAL GROUPS PRESENT IN THE MAIN INGREDIENT, SURFACTANT, TO EVALUATE THEIR TOXICITY, SURFACTANT CONCENTRATIONS IN SEA WATER, AFTER ITS USE IN DISPERSING THE OIL, WAS ALSO DETERMINED.

CONTROL OF OIL SLICKS IN FLOWING WATER USING AIR BUBBLE BARRIERS. - 81-01 24193

LAU, Y. L. ENGEL, P.

CAN. J. CIV. ENG., 7(2), 397-405 (1980) LANGUAGE(S)- ENGLISH, FRENCH AFFILIATION- (HYDRAUL. RES. DIV., NATL. WATER RES. INST., BURLINGTON, ONT. L7R 4A6, CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0035-4947-0

A LABORATORY INVESTIGATION WAS CARRIED OUT TO STUDY THE EFFECTIVENESS OF AIR BUBBLE BARRIERS FOR THE CONTAINMENT AND DIVERSION OF OIL SLICKS IN OPEN-CHANNEL FLOWS. IT WAS DISCOVERED THAT AIR BARRIERS COULD NOT DETAIN OIL SLICKS COMPLETELY BUT WERE VERY SUCCESSFUL AS DIVERTERS. GUIDELINES FOR ANGLES OF BARRIERS REQUIRED FOR DIVERSION AND FOR ESTIMATION OF OIL LOSS RATES WERE OBTAINED.

OIL POLLUTION AND PENGUINS _ IS CLEANING JUSTIFIED? - 81-01 19163

RANDALL, R. M. RANDALL, B. M. BEVAN, J.

MAR. POLLUT. BULL., 11(8), 234-237 (1980) LANGUAGE(S)- ENGLISH AFFILIATION (DEP. ZOOL., UNIV. PORT ELIZABETH, POB 1600, PORT ELIZABETH 6000, SOUTH AFRICA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0034-8415-2

OIL POLLUTION HAS BEEN THE MAIN MORTALITY FACTOR OF ADULT JACKASS PENGUINS

SPHENISCUS DEMERSUS, FOUND DEAD ON ST. CROIX I., SOUTH AFRICA, OVER A 3½ YR PERIOD IN JULY 1979, 150 OILED PENGUINS FOUND ON THE ISLAND WERE SENT TO THE SOUTH AFRICAN FOUNDATION FOR THE CONSERVATION OF COASTAL BIRDS (SANCCOB) TO ASSESS THE EFFECTIVENESS OF CLEANING AND REHABILITATION ATTEMPTS. OIL WAS REMOVED WITH A DETERGENT AND IN SEVERE CASES WITH LIQUID PARAFFIN. THE MORTALITY RATE BEFORE AND DURING TREATMENT WAS 32%. ONCE WATERPROOF, THE PENGUINS WERE RELEASED AT SEA NEAR CAPE TOWN. BY FEB 1980, 87% OF THOSE RELEASED HAD RETURNED TO ST. CROIX I. THEY APPEARED HEALTHY, MOULTED NORMALLY, RETURNED TO FORMER NESTS AND MATES AND 6 HAD PRODUCED CLUTCHES. SANCCOB HAS TREATED 651 OILED PENGUINS SINCE 1968, AND, BASED ON THESE RELEASE AND REHABILITATION RATES, ATTEMPTS TO CLEAN AND REHABILITATE OILED PENGUINS ARE JUSTIFIED.

OIL, OIL DISPERSANTS AND RELATED SUBSTANCES IN THE MARINE ENVIRONMENT. - 81-01 00803

GUNKEL, W. GASSMANN, G.

HELGOLANDER MEERESUNTERS., 33(1-4), 164-181 (1980). LANGUAGE(S)- ENGLISH AFFILIATION- (BIOL. ANST. HELGOLAND (MEERESSTN.), D-2192 HELGOLAND, GFR) TYPE- JOURNAL ARTICLE ; REVIEW NDN- 032-0034-8341-0

THE PAST AND PRESENT STATE OF OIL POLLUTION RESEARCH IS REVIEWED, STRESSING THE NEED FOR OBJECTIVE CRITICAL EVALUATION AND CAREFUL QUANTIFICATION IN FUTURE RESEARCH.

RESEARCH INTO TOXICITY EVALUATION AND CONTROL CRITERIA OF OIL DISPERSANTS. - 80-12 00346

NORTON, M. G. FRANKLIN, F. L.

FISH. RES. TECH. REP., DIR. FISH. RES. (G.B.), (NO.57) PUBL. BY: MAFF. LOWESTOFT (UK), 1980. 24 P. LANGUAGE(S)- ENGLISH CORP. AUTH- DIRECTORATE OF FISHERIES RESEARCH, LOWESTOFT (UK). AFFILIATION- (FISH. LAB., REMEMBRANCE AVENUE, BURNHAM-ON-CROUCH, ESSEX, CM0 8HA, UK) TYPE- MONOGRAPHIC SERIES NDN- 032-0034-7926-0

OIL DISPERSANTS ARE LICENSED UNDER THE DUMPING AT SEA ACT 1974 FOR USE AT SEA OR ON BEACHES, BASED ON THE RESULTS OF TWO TOXICITY TESTS DESIGNED TO REFLECT THEIR CONDITIONS OF USE. THIS REPORT DESCRIBES THE RATIONALE BEHIND THE DEVELOPMENT OF THESE TESTS, TOGETHER WITH THE CRITERIA USED FOR LICENSING AND THE RESULTS OBTAINED. THE EFFECT ON THE RESULTS OF ALTERING TEST VARIABLES INCLUDING THE DEGREE OF MIXING, SOURCE OF SOIL AND CONCENTRATION OF OIL AND DISPERSANT ARE ALSO DESCRIBED. A DISCUSSION ON THE PREDICTED ENVIRONMENTAL IMPACT OF DISPERSANT USE, BASED ON THE RESULTS OF THESE TESTS, IS INCLUDED.

MANUAL OF PRACTICE FOR PROTECTION AND CLEANUP OF SHORELINES. VOLUME 1: DECISION GUIDE. 80-12 00242

FOGET, C. R. SCHRIER, E. CRAMER, M. CASTLE, R.

PUBL. BY: W-CC: SAN FRANCISCO, CA (USA). AUG 1979. 124 P. EPA-600/7-79-187A-VOL-1. CONTRACT EPA-68-03-2542. LANGUAGE(S)- ENGLISH, NORWEGIAN CORP. AUTH- WOODARD-CLYDE CONSULT., SAN FRANCISCO, CA (USA). TYPE- REPORT NDN- 032-0034-7868-1

A SYSTEMATIC, EASY TO APPLY METHODOLOGY THAT CAN BE USED TO ASSESS THE THREAT OF AN OIL SPILL AND SELECT THE MOST APPROPRIATE PROTECTION AND CLEANUP TECHNIQUES IS PRESENTED. A DETAILED DISCUSSION OF THE FACTORS INVOLVED IN THE DECISION-MAKING PROCESS IS GIVEN AND INCLUDES OIL CHARACTERISTICS, BEHAVIOR AND MOVEMENT OF OIL, SHORELINE CHARACTERIZATION AND SENSITIVITY, PROTECTION AND CLEANUP PRIORITIES AND IMPLEMENTATION REQUIREMENTS, AND IMPACTS ASSOCIATED WITH CLEANUP OPERATIONS.

MANUAL OF PRACTICE FOR PROTECTION AND CLEANUP OF SHORELINES. VOLUME 2: IMPLEMENTATION GUIDE. - 80-12 00243

FOGET, C. R. SCHRIER, E. CRAMER, M. CASTLE, R.

PUBL. BY: W-CC: SAN FRANCISCO, CA (USA). AUG 1979. 137 P. EPA-600/7-79-187B. CONTRACT EPA-68-03-2542. LANGUAGE(S)- ENGLISH, NORWEGIAN CORP. AUTH- WOODARD-CLYDE CONSULT., SAN FRANCISCO, CA (USA). TYPE- REPORT NDN- 032-0034-7867-0

THE INFORMATION REQUIRED FOR THE IMPLEMENTATION OF AN EFFECTIVE RESPONSE TO AN OIL SPILL IS CONSIDERED. SPECIFICALLY, INFORMATION SOURCES OF OIL SPILLS AND SHORELINE DATA ARE CITED, OIL CHARACTERISTICS, BEHAVIOR AND MOVEMENT OF OIL, SHORELINE CHARACTERIZATION AND SENSITIVITY, PROTECTION AND CLEANUP PRIORITIES AND IMPLEMENTATION REQUIREMENTS, AND IMPACTS ASSOCIATED WITH CLEANUP OPERATIONS ARE INCLUDED.

THE IMPACT OF OIL AND GAS PRODUCTION FROM THE MARINE ENVIRONMENT: AN ANALYSIS OF THE RECORD. PRESENTED AT: MARINE SCIENCES AND OCEAN POLICY SYMPOSIUM; SANTA BARBARA, (USA); JUN 1979. - 80-12 01082

IN: MARINE SCIENCES AND OCEAN POLICY SYMPOSIUM, SANTA BARBARA, CA (USA), JUNE 1979. A DEFINITION OF THE ISSUES AND A SEARCH FOR A CONSENSUS ON MULTIPLE USES. A SYMPOSIUM ON THE OCCASION OF THE INAUGURATION OF ROBERT A. HUTTENBACK AS CHANCELLOR UNIVERSITY OF CALIFORNIA AT SANTA BARBARA. SIMONETT, D.S. (ED.). CALIFORNIA UNIV., SANTA BARBARA (USA). PUBL. BY: UCSB; SANTA BARBARA, CA (USA). JUN 1979. P. 221-233 ISBN 0-937202-00-2 LANGUAGE(S)- ENGLISH AFFILIATION- (UNION SCI. AND TECHNOL. DIV.; CALIFORNIA UNION OIL CO., BREA, CA, USA) TYPE- BOOK : CHAPTER NDN- 032-0034-5538-3

THE ANNUAL LOAD OF PETROLEUM HYDROCARBONS WHICH REACH THE SEA COMES FROM VARIOUS PETROLEUM SOURCES. TRANSPORTATION (TANKERS, ETC.) IS BY FAR THE WORST OFFENDER WITH RIVER AND URBAN RUNOFFS A CLOSE SECOND. SPILLS FROM OFFSHORE OIL PRODUCTION ARE ALMOST INSIGNIFICANT. IT IS NOT WELL RECOGNIZED THAT NATURAL SEEPS PUT ABOUT 7.5 TIMES MORE HYDROCARBONS INTO THE SEAS THAN DO SPILLS FROM OFFSHORE OIL PRODUCTION. THE OCEANS ALSO CONTAIN HYDROCARBONS THAT COME FROM BIOGENIC PROCESSES OCCURRING IN THE SEA AND ON THE SEA BOTTOM. THE RECOVERY OF POLLUTED AREAS VARIES DEPENDING ON THE FLUSHING OF THE POLLUTED AREA, THE TYPE OF SEDIMENT AND THE DEGREE OF ISOLATION OF ITS ECOSYSTEMS AND THE KINDS OF ORGANISMS THAT FORM THEM. OIL LINGERS FOR DIFFERENT PERIODS IN DIFFERENT LOCATIONS, AND ACCORDINGLY RECOVERY TIMES VARY. A WHOLE NEW ARE OF SCIENTIFIC RESEARCH, THAT RELATED TO OIL SPILLS, THEIR EFFECTS, THEIR FATES, THEI CLEAN-UP AND THEIR PREVENTION, HAS COME INTO BEING DURING THE PAST TEN YEARS. AS A RESULT OF THESE EFFORTS, IMPROVEMENTS HAVE BEEN MADE IN MEANS FOR CONTAINING OIL SPILLS (EXCEPT IN HIGH SEAS), LESS TOXIC DISPERSANTS, NEW EFFICIENT SKIMMERS FOR TAKING OIL OFF WATER SURFACES, SELECTION AND DEVELOPMENT OF SUITABLE METHODS FOR CLEANING BEACHES AND LAST BUT NOT LEAST, WAYS TO MINIMIZE OFFSHORE OIL SPILLS.

PREVENTION AND COMBATING OF OIL POLLUTION AT KNYSNA. - 80-11 00253

RETIEF, G. DE F. VONK, A. P. M. MULLIGAN, D. S. F.

S. AFR. J. SCI., 75(12), 563 (1979). SUMMARY ONLY. LANGUAGE(S)- ENGLISH AFFILIATION- (OCEAN ENG. RES. GROUP, UNIV. STELLENBOSCH, SOUTH AFRICA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0033-7420-6

A NUMBER OF STUDIES HAVE BEEN MADE OF WAYS OF PREVENTING OIL POLLUTION OF THE KNYSNA ESTUARY IN THE EVENT OF AN OIL SPILL AT SEA. THE CIRCUMSTANCES UNDER WHICH OIL COULD ENTER THROUGH THE KNYSNA HEADS IF NO PREVENTIVE MEASURES WERE TAKEN, ALONG WITH VARIOUS MEANS OF SOLVING THE PROBLEM, ARE REVIEWED. ATTENTION IS FOCUSED ON THE POSSIBLE USE OF OIL BARRIERS (BOOMS) AND THEIR PROBABLE EFFECTIVENESS AT VARIOUS LOCATIONS IS EVALUATED. THE CONCLUSIONS DRAWN ARE THAT THE PROBABILITY OF OIL ENTERING KNYSNA LAGOON FROM A SPILL AT SEA IS REMOTE, IF OIL DID ENTER BETWEEN THE HEADS IN ANY SIGNIFICANT QUANTITIES (PROBABLE MAXIMUM ON ANY TIDAL CYCLE BEING ABOUT 1,000 M 3), THE OPTIMUM SOLUTION APPEARS TO BE A FLEXIBLE SKIRT BOOM DEPLOYED DIAGONALLY ACROSS THE FLOW BETWEEN THE SOUTH SHORE OF THE LAGOON AND LEISURE ISLAND. A BOOM IN THIS POSITION IS LIKELY TO BE EFFECTIVE IN ALL CIRCUMSTANCES EXCEPT PEAK SPRING TIDES AND EXCEPTIONAL WIND CONDITIONS, AND ITS SUCCESS WILL DEPEND ON THE EFFICIENCY AND PREPAREDNESS OF THE DEPLOYMENT TEAM. ALTHOUGH NO EXACT SOLUTION TO TH CAPITAL EXPENDITURE/ECOLOGICAL-BENEFIT EQUATION CAN EVER BE EXPECTED, ATTEMPTS SHOUL NEVERTHELESS BE MADE TO IDENTIFY AREAS OF VARYING SENSITIVITY IN SOUTH AFRICA'S RICHER ESTUARIES. THIS INFORMATION, ALONG WITH IMPROVED BOOM DESIGN METHODS WHICH AR URGENTLY NEEDED, CAN LEAD TO A WORTHWHILE OIL POLLUTION PREVENTION STRATEGY FOR ALL OF SOUTH AFRICA'S ESTUARIES.

EFFECTS OF OIL POLLUTION ON CORAL REEF COMMUNITIES. - 80-11 00264

LOYA, Y. RINKEVICH, B.

MAR. ECOL. PROG. SER., 3(2), 167-180 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. ZOOL., GEORGE S. WISE CENT. LIFE SCI., TEL-AVIV UNIV., TEL-AVIV, ISRAEL) TYPE- JOURNAL ARTICLE : REVIEW NDN- 032-0033-4612-0

THIS PAPER REVIEWS OUR KNOWLEDGE OF OIL-POLLUTION EFFECTS ON CORAL-REEF COMMUNITIES, CONCENTRATING ON RESEARCH DONE SINCE 1975. THE REVIEW FOCUSSES ON CRUDE-OIL EFFECTS ON SCLERACTINIAN CORALS AND OCTOCORALS AND SUMMARIZES THE SMALL AMOUNT OF WORK CONDUCTED ON OTHER REEF ORGANISMS, AS WELL AS ON THE REEF FLORA. LABORATORY EXPERIMENTS AND LONG-TERM FIELD STUDIES IN THE RED SEA WITNESS DETRIMENTAL EFFECTS O OIL POLLUTION ON REEF CORALS, SUCH AS COMPLETE LACK OF COLONIZATION BY HERMATYPIC CORALS IN REEF AREAS CHRONICALLY POLLUTED BY OIL, DECREASE IN COLONY VIABILITY, DAMAGE TO THE REPRODUCTIVE SYSTEM OF CORALS, LOWER LIFE EXPECTANCY OF PLANULAE AND ABNORMAL BEHAVIOURAL RESPONSES OF PLANULAE AND CORALS. OTHER DETRIMENTAL EFFECTS ON REEF CORALS CAUSED BY CRUDE OIL, MAINLY REPORTED FROM THE CARIBBEAN, INCLUDE LOWER GROWTH RATES, DIRECT DAMAGE TO TISSUES, THINNING OF CELL LAYERS AND DISRUPTION OF CELL STRUCTURE, DAMAGE TO TACTILE STIMULI AND NORMAL FEEDING MECHANISMS, EXCESSIVE MUCUS SECRETION LEADING TO ENHANCED BACTERIAL GROWTH AND EVENTUAL CORAL DESTRUCTION.

ALL INVESTIGATORS STUDYING EFFECTS OF CRUDE-OIL EMULSIFIERS ON REEF AREAS POLLUTED B OIL CONCLUDE THAT THESE ENHANCE THE DAMAGE HENCE MECHANICAL OIL REMOVAL IS RECOMMENDED. SUGGESTIONS ARE MADE AS TO THE TYPE OF STUDIES REQUIRED FOR A BETTER UNDERSTANDING OF THE PROBLEM.

INVESTIGATION OF THE EFFECTS OF OIL VISCOSITY AND WATER-IN-OIL EMULSION FORMATION ON DISPERSANT EFFICIENCY. - 80-11 00011

MARTINELLI, F. N. CORMACK, D.

PUBL. BY: WARREN SPRING LAB.; STEVENAGE (UK). 1979. 12 P. ISBN 0-85624-168-7. LANGUAGE(S)- ENGLISH AFFILIATION- (WARREN SPRING LAB., DEP. IND., GUNNELS WOOD ROAD, STEVENAGE, HERTFORDSHIRE SG1 2BX, UK) TYPE- REPORT NDN- 032-0033-1781-8

A SIMPLE REVOLVING FLASK EFFICIENCY TEST HAS BEEN USED TO DETERMINE THE EFFECT OF WEATHERING ON THE EFFICIENCY OF CONCENTRATE DISPERSANTS, CHARACTERISED BY THE INCREASE IN VISCOSITY DUE TO (A) WATER-IN-OIL EMULSION FORMATION AND (B) EVAPORATION OF LOW MOLECULAR WEIGHT COMPONENTS. RESULTS IN EACH CASE INDICATE A RAPID FALL IN EFFICIENCY BETWEEN 1000 AND 10,000 CP. DUE TO THE MECHANICAL DIFFICULTIES IN OBTAINING INTIMATE MIXING BETWEEN THE OIL AND DISPERSANT. HIGHER EFFICIENCIES WERE OBTAINED BY USING THE DISPERSANT UNDILUTED RATHER THAN AS A 10% DILUTION IN SEAWATER WITH THE DIFFERENCES BECOMING GREATER WITH INCREASING VISCOSITY. THE SIGNIFICANT OF THESE FINDINGS IS DISCUSSED WITH REFERENCE TO DISPERSANT TESTING, SPRAYING METHODS A SEA AND THE INTRODUCTION OF AN OPERATION CUT OFF POINT FOR SPRAYING, BASED ON THE VISCOSITY OF THE SPILLED OIL OR EMULSION.

DISPERSANT GELS FOR TREATING SURFACES CONTAMINATED WITH RESIDUAL OILS. - 80-11 00012

NICHOLS, J. A.

PUBL. BY: WARREN SPRING LAB.; STEVENAGE (UK). 1979. 12 P. ISBN 0-85624-180-6. (REVISED BY B. LYNCH) LANGUAGE(S)- ENGLISH AFFILIATION- (WARREN SPRING LAB., DEP. IND., GUNNELS WOOD ROAD, STEVENAGE, HERTFORDSHIRE SG1 2BX, UK) TYPE- REPORT NDN- 032-0033-1780-6

THIS REPORT DESCRIBES A TECHNIQUE FOR THE REMOVAL OF RESIDUAL OIL FROM SOLID SURFACE SUCH AS PROMENADES, PIERS AND JETTIES. A LOW TOXICITY GEL IS PRODUCED IN SITU FROM A HYDROCARBON-SOLVENT-BASED DISPERSANT AND APPLIED TO THE CONTAMINATED SURFACE. THE INCREASED CONTACT TIME BETWEEN THE DISPERSANT AND OIL AFFORDED BY THE GEL AS COMPARED WITH A LIQUID, ENABLES WEATHERED DEPOSITS TO BE REMOVED BY SUBSEQUENT HOSIN DOWN OR TIDAL ACTION. THE TECHNIQUE IS PARTICULARLY SUITABLE FOR TREATING VERTICAL SURFACES. THE NECESSARY MATERIALS AND EQUIPMENT TO PRODUCE GELS ARE DESCRIBED. THIS REPORT SUPERSEDES REPORT LR 216 (OP) ISSUED IN 1975 AND INCLUDES AND UPDATED LIST O APPROVED DISPERSANT CHEMICALS. THIS LIST IS UNDER CONSTANT REVSION.

CHANGES IN THE ULTRASTRUCTURE OF THE GILL EPITHELIUM OF PATELLA VULGATA AFTER EXPOSUR TO NORTH SEA CRUDE OIL AND DISPERSANTS. - 80-11 02112

NUWAYHID, M. A. DAVIES, P. S. ELDER, H. Y.

J. MAR. BIOL. ASSOC. UK. 60(2). 439-448 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. ZOOL., UNIV. GLASGOW, GLASGOW, UK) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0032-9654-2

IN ORDER TO INVESTIGATE CELLULAR DAMAGE ASSOCIATED WITH EXPOSURE TO POLLUTANTS, THE EPITHELIA OF THE GILLS OF PATELLA WERE EXAMINED AFTER EXPOSURE TO EITHER SUBLETHAL CONCENTRATIONS OR TO SUBLETHAL DURATIONS OF THE WATER SOLUBLE FRACTION OF NORTH SEA CRUDE OIL AND TO THE DISPERSANTS BP 1100 X AND BP 1100 WD. LESIONS WERE FOUND ON PARTS OF ALL GILLS AT ALL CONCENTRATIONS USED. BOTH CRUDE OIL AND DISPERSANTS CAUSED DAMAGE TO SURFACE MICROVILLI AND TO CILIA WHEN VIEWED UNDER THE SCANNING ELECTRON MICROSCOPE. TRANSMISSION ELECTRON MICROSCOPY REVEALED SEVERE DISRUPTION OF NORMAL CELLULAR ORGANIZATION. THE DIFFICULTY OF SEPARATING THE PRIMARY EFFECTS DUE TO THE POLLUTANT FROM SECONDARY EFFECTS WHICH ARE ASSOCIATED WITH THE PROCESSES OF CELL DEATH ARE DISCUSSED, AND SOME PRIMARY INDICATORS WHICH MIGHT BE SUITABLE FOR THE EARLY DIAGNOSIS OF POLLUTION DAMAGE ARE SUGGESTED.

MITIGATING OIL SPILL DAMAGE - ECOLOGICALLY RESPONSIBLE CLEAN-UP TECHNIQUES. PRESENTED AT: THE MITIGATION SYMPOSIUM: A NATIONAL WORKSHOP ON MITIGATING LOSSES OF FIS AND WILDLIFE HABITATS: FORT COLLINS, CO (USA): 16 JUL 1979. - 80-11 00042

COX, G. V. COWELL, E. B.

GEN. TECH. REP. U. S. DEP. AGRIC. IN : THE MITIGATION SYMPOSIUM: A NATIONAL WORKSHOP ON MITIGATING LOSSES OF FISH AND WILDLIFE HABITATS, COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO, JULY 16-20, 1979. PUBL. BY: US DEP. AGRICULTURE: FORT COLLINS, CO (USA). 1979. P. 121-128. USDA-RM-65. LANGUAGE(S)- ENGLISH AFFILIATION- (CHEMICAL MANUF. ASSOC., WASHINGTON, DC, USA) TYPE- BOOK : CHAPTER NDN- 032-0032-7411-0

EFFECTIVE MITIGATION REQUIRES PREPLANNING EXPERIENCE, ECOLOGICAL INPUT TO PLANNING AND THE EVENT, AND A THOROUGH UNDERSTANDING OF POLITICAL AND SOCIAL DEMANDS IN OIL SPILLS CLEAN-UP PROGRAMS. ATTENTION TO PUBLIC SAFETY SHOULD RECEIVE PRIMARY ATTENTIO BEFORE THE ECOLOGICAL AND SOCIAL CONSIDERATIONS. THE CLEAN-UP TECHNIQUES AND THEIR RESULTS ARE ANALYZED.

THE AMOCO CADIZ OIL SPILL - A PRELIMINARY SCIENTIFIC REPORT. - 80-10 00471

HESS, W. N.

PUBL. BY: NOAA/ERL: BOULDER, CO (USA). APR 1978. 275 P. NOAA/EPA SPECIAL REPORT. LANGUAGE(S)- ENGLISH CORP. AUTH- NOAA ENVIRONMENTAL RESEARCH LABS, BOULDER, CO (USA); ENVIRONMENTAL PROTECTION AGENCY, NARRAGANSETT, RI (USA) TYPE- BOOK : EDITED COLLECTION NDN- 032-0032-7303-7

THIS DOCUMENT PROVIDES A PRELIMINARY ACCOUNT OF THE UNITED STATES SCIENTIFIC EFFORTS IN RESPONSE TO THE AMOCO CADIZ OIL SPILL DURING THE PERIOD MARCH 19 TO MAY 15, 1978. THE DOCUMENT EXPANDS ON AND UPDATES MATERIAL REPORTED BY THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION IN APRIL 1978 IN 'THE AMOCO CADIZ OIL SPILL: A FIRST REPORT OF THE SOR TEAM ACTIVITIES.' MATERIAL REPORTED HEREIN IS PRELIMINARY; FINAL ASSESSMENT OF FULL IMPACT OF THE INCIDENT WILL REQUIRE THE INTEGRATION AND INTERPRETATION OF DATA TAKEN BY SCIENTISTS FROM SEVERAL NATIONS. IT IS ANTICIPATED THAT FINAL ASSESSMENT OF THE FULL EXTENT OF THE IMPACT MAY REQUIRE A PERIOD OF SEVERAL YEARS. THE FOLLOWING INVESTIGATIONS ARE CATALOGUED IN THIS ISSUE OF ASFA 1 AND 2: PHYSICAL PROCESSES; CHEMICAL COMPOSITION; BEACH PROCESSES; BIOLOGICAL OBSERVATIONS; AND OIL SPILL CLEANUP ACTIVITIES.

OIL REMOVAL FROM WATER SURFACE WITH OKITEN, EKOPERL 33 OR EKOPERL 66. - 80-10 13672

SLJIVARIC, Z. MIJATOVIC, I. VUKAS DELAS, V.

PREHRAMBENO-TEHNOL. REV. 15(1), 22-24, (1977) LANGUAGE(S)- ENGLISH, SERBO-CROAT AFFILIATION- (TEHNOLOSKI FAKULTET, ZAGREB, YUGOSLAVIA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0032-4479-7

THE POSSIBILITY OF MINERAL OIL REMOVAL FROM THE WATER SURFACE, APPLYING CHIPS OF POLYETHYLENE WAS INVESTIGATED. IT WAS FOUND THAT SMALL AMOUNTS OF POLYETHYLENE ADSORBED, ON ITS SURFACE, MORE THAN 90% OF MINERAL OIL FROM THE WATER SURFACE. MODEL-SOLUTIONS WERE USED WHICH CONTAINED A KNOWN AMOUNT OF MINERAL OIL, BUT THE AMOUNT OF POLYETHYLENE, THE DIMENSION OF GRANULATION, AND THE TIME OF CONTACT WERE CHANGED. THE RESULTS INDICATE THAT GRANULATION AND THE AMOUNT OF POLYETHYLENE HAVE A GREATER EFFECT ON THE REMOVAL OF THE OIL, THAN THE LENGTH OF TIME. OKITEN, THE GRANULATION OF WHICH HAS BEEN LESS THAN 0.8 MM, REMOVED MINERAL OIL FROM WATER SURFACE AS WELL AS EKOPERL 33, OR EKOPERL 66.

OIL SPILL CLEANUP ACTIVITIES. - 80-10 04578

HANN, R. W., JR. RICE, L. TRUJILLO, M C. YOUNG, H. N., JR.

IN : THE AMOCO CADIZ OIL SPILL - A PRELIMINARY SCIENTIFIC REPORT. HESS, W.N. (ED.) NOAA ENVIRONMENTAL RESEARCH LABS., BOULDER, CO (USA); ENVIRONMENTAL PROTECTION AGENCY, NARRAGANSETT, RI (USA). PUBL. BY: NOAA/ERL: BOULDER, CO (USA) APR 1978. P. 229-275. NOAA/EPA SPECIAL REPORT. LANGUAGE(S)- ENGLISH AFFILIATION- (TEXAS A AND M UNIV., COLLEGE STATION, TX, USA) TYPE- BOOK : CHAPTER NDN- 032-0032-1822-1

THE OIL SPILL FROM THE SUPERTANKER AMOCO CADIZ OFF THE BRITTANY COAST OF FRANCE OVERSHADOWS BY FAR ANY OTHER SPILL INTO THE MARINE ENVIRONMENT. IN TERMS OF OIL REACHING THE SHORE, IT WAS ON THE ORDER OF FOUR TIMES THE AMOUNT OF THE TORREY CANYON SPILL IN THE SAME GENERAL GEOGRAPHIC AREA OR THE METULA SPILL IN THE STRAITS OF MAGELLAN. AS A RESULT, THE SPILL AND THE SUBSEQUENT ACTIVITIES TO CLEAN U THE OIL AND MITIGATE DAMAGE PROVIDED A FASCINATING LABORATORY FOR THOSE INTERESTED I INSTITUTIONAL STRUCTURE, PLANNING, RESOURCE REQUIREMENTS, TECHNOLOGY AND TRAINING TO DEAL WITH DISASTERS OF THIS MAGNITUDE. THE PHYSICAL PROPERTIES, BEHAVIOR, AND MOVEMENT OF THE OIL AND ITS ULTIMATE DEPOSITION ON THE BEACHES IS DISCUSSED IN

DETAIL. THE ORGANIZATIONAL STRUCTURE ESTABLISHED TO DEAL WITH THE SPILL AND THE STRATEGY OF CONTROL THAT APPEARS TO HAVE BEEN FOLLOWED ARE PRESENTED AND EVALUATED WITH REGARD TO THEIR UTILITY IN OTHER SPILLS. IN ADDITION THE PROCESSES AND UNIT OPERATIONS USED ON THE BEACHES ARE DISCUSSED. ESTIMATES OF THE MANPOWER AND EQUIPMEN USED AT DIFFERENT TIMES THROUGHOUT THE SPILL ARE BASED ON EXTENSIVE REVIEWS OF NEWSPAPER REPORTS AND DAILY POLLUTION REPORTS ISSUED BY THE DEPARTMENT OF EQUIPMENT. THE FINAL SECTION DISCUSSES WHAT HAS BEEN LEARNED FROM THIS EXPERIENCE.

THE IMPACT OF CRUDE OIL AND OIL DISPERSANTS ON THE MARINE OLIGOCHAETE MARIANINA SUBTERRANEA . - 80-09 08219

GIERE, O.

CAH. BIOL. MAR., 21(1): 51-60 (1980) LANGUAGE(S)- GERMAN, ENGLISH, FRENCH AFFILIATION- (ZOOL. INST. AND ZOOL. MUS., UNIV. HAMBURG, MARTIN-LUTHER-KING-PLATZ 3, 2000 HAMBURG 13, GFR) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0031-4112-1

SURVIVAL OF THE UBIQUITOUS MARINE INTERSTITIAL OLIGOCHAETE M. SUBTERRANEA IN SHORT-TERM EXPERIMENTS WITH ARABIAN LIGHT CRUDE OIL WAS IN CORRESPONDANCE WITH THE FAIRLY HIGH RESISTANCE OF THE SPECIES IN FIELD STUDIES: CONCENTRATIONS OF 1,000 PPM CRUDE HAD ONLY LITTLE NEGATIVE EFFECT, WHEREAS PURE SOLUTIONS OF THE OLD-TYPE DISPERSANT MARLOPHEN 86 5 E WERE HIGHLY TOXIC EVEN IN LOW CONCENTRATIONS. THEIR TOXICITY WAS SOMEWHAT LOWERED IN DISPERSIONS WITH CRUDE OIL. IN MODERN AGENTS (COREXIT 7664, FINASOL OSR-2 AND OSR-5), MORTALITY USUALLY WAS VERY LOW, BUT INCREASED IN MIXTURES WITH OIL. COMBINATIONS OF SEVERAL MODERN DISPERSANTS SEEM TO CAUSE SYNERGISTIC NOXIOUS EFFECTS. BASED ON THESE RESULTS, EFFECTS OF OIL SPILLS ON LIFE CONDITIONS OF LITTORAL MEIOFAUNA ARE CONSIDERED.

REMOVAL OF GREASE AND OIL BY BIOLOGICAL TREATMENT PROCESSES. - 80-09 00332

YOUNG, J. C.

J. WATER POLLUT. CONTROL FED., 51(8): 2071-2087 (1979) LANGUAGE(S)- ENGLISH AFFILIATION- (IOWA STATE UNIV., AMES, IA, USA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0031-2573-5

A STUDY WAS INITIATED TO DEVELOP A BETTER UNDERSTANDING OF GREASE AND OIL REMOVAL BY FULL-SCALE TREATMENT PLANTS OF VARIOUS TYPES AND TO IDENTIFY WASTEWATER CHARACTERISTICS AND OPERATING PARAMETERS AFFECTING GREASE AND OIL REMOVAL. LABORATOR TESTS WERE CONDUCTED TO SUPPLEMENT FIELD OBSERVATIONS, AND CONSIDERATION WAS GIVEN T THE POLAR AND NONPOLAR CHARACTER OF THE GREASES AND OILS AND TO THEIR BIODEGRADABILITY.

COLD OIL SALVAGE PUMPS. - 80-09 01330

JOLLIFF, J. V. MITTLEMAN, J.

NAV. ENG. J., 92(2): IN : ASNE DAY 1980: TECHNICAL PAPERS, AMERICAN SOCIET OF NAVAL ENGINEERS, WASHINGTON, DC (USA) 1980. P.239-251 SPECIAL ISSUE: CONFERENCE PROCEEDINGS. LANGUAGE(S)- ENGLISH AFFILIATION- (ELECTRICAL SYSTEMS GROUP (SEA 54), NAV. SEA SYST. COMMAND, WASHINGTON, DC, USA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0031-1575-4

HYDRAULICALLY POWERED, SUBMERSIBLE OIL TRANSFER PUMPS WERE TESTED AT THE NAVAL COASTAL SYSTEMS CENTER. THE TESTS WERE PERFORMED UNDER CONTROLLED TEMPERATURE AND DISCHARGE PRESSURE CONDITIONS TO SIMULATE THE COLD WEATHER AND LONG DISCHARGE LINES OFTEN ENCOUNTERED DURING EMERGENCY OIL OFFLOADING IN HIGH LATITUDES. FIVE DIFFERENT PUMPS WERE TESTED. OF THE FIVE PUMPS, TWO WERE CENTRIFUGAL, TWO WERE PROGRESSIVE CAVITY TYPES, AND ONE WAS A VERTICAL TURBINE PUMP. THE TWO CENTRIFUGAL PUMPS PERFORMED BETTER THAN WAS EXPECTED WHILE THE VERTICAL TURBINE PUMP WAS DETERMINED TO BE UNSUITABLE AT THE LOWER TEST TEMPERATURES. THE PROGRESSIVE CAVITY PUMPS WERE DETERMINED TO BE UNSUITABLE IN THEIR PRESENT CONFIGURATIONS, BUT DESERVE FURTHER INVESTIGATION BECAUSE OF THEIR UNIQUE PROPERTIES. THE TEST EFFORT LED TO THE DEVELOPMENT OF AN EMPIRICAL METHOD FOR ESTIMATING PUMP EFFICIENCY AT EXTREMELY HIGH VISCOSITIES, AND MOST IMPORTANT, TO THE CREATION OF A NAVY SPECIFICATION FOR THE DEVELOPMENT AND PROCUREMENT OF A PETROLEUM, OILS, AND LUBRICANTS TRANSFER SYSTEM TO BE USED FOR OFFLOADING STRANDED TANKERS IN EMERGENCY SITUATIONS.

UNITED KINGDOM GOVERNMENT ORGANISATION FOR MARINE POLLUTION CONTROL. - 80-09 04077

STACEY, M. L.

IN: OCEANOLOGY INTERNATIONAL 80. CONFERENCE PAPERS, PUBL. BY: BPS EXHIBITIONS LTD.: BRIGHTON (UK). 1980. TECH. SESS. M, P. 3-5. LANGUAGE(S)- ENGLISH AFFILIATION- (MARINE POLLUTION CONTROL UNIT, DEP. TRADE, LONDON, UK) TYPE- BOOK : CHAPTER NDN- 032-0030-7013-8

THE FOLLOWING SUBJECTS ARE COVERED: (1) THE RECENT GOVERNMENT REVIEW OF THE UK ORGANISATION FOR MARINE POLLUTION CONTROL POST- AMOCO CADIZ. THE CASE FOR DEDIC FORCES ARE CONSIDERED AND THE CURRENT ORGANISATION IS DESCRIBED. (2) THE VARIOUS GOVERNMENT DEPARTMENTAL RESPONSIBILITIES IN THE MATTER ARE DELINEATED. (3) THE RECENTLY FORMED UK GOVERNMENT MARINE POLLUTION CONTROL UNIT ARE DESCRIBED. (4) T PHILOSOPHY OF DISPERSANT AND MECHANICAL RECOVERY OF OIL AT SEA IS DISCUSSED TAK ACCOUNT OF ECOLOGICAL, ECONOMIC AND AMENITY INTERESTS. (5) INTERNATIONAL RELATIONSHIPS. (6) UK GOVERNMENT POWERS OF INTERVENTION ARE DEFINED TO ASSOCIATE THEM SALVAGE AND THE NEED FOR SAFE HAVENS. (7) THE FUTURE.

COMBATING OIL SPILLS IN THE MARINE ENVIRONMENT. - 80-09 04081

BEYNON, L. R.

IN: OCEANOLOGY INTERNATIONAL 80. CONFERENCE PAPERS. PUBL. BY: BPS EXHIBITIONS LTD.: BRIGHTON (UK). 1980. TECH SESS: M. P. 26-33. LANGUAGE(ENGLISH AFFILIATION- (ENVIRONMENTAL CONTROL CENTRE, BP TRADING LTD., LONDON. TYPE- BOOK : CHAPTER NDN- 032-0030-7009-6

TECHNIQUES FOR DEALING WITH OIL SPILLS ARE REVIEWED.

FUNDAMENTAL STUDIES ON THE INFLUENCE OF OIL POLLUTION UPON MARINE ORGANISMS. IV. TH TOXICITY OF MIXTURES OF OIL PRODUCTS AND OIL-SPILL EMULSIFIERS TO PHYTOPLANKTON. - 82957

TOKUDA, H.

BULL. JAP. SOC. SCI. FISH., 45(10), 1289-1291 (1979) LANGUAGE(S)- ENGLISH, JAPANESE AFFILIATION- (DEP. FISH., UNIV. TOKYO, TOKYO, JAPAN) TYPE- JOU ARTICLE: ORIG. RESEARCH NDN- 032-0030-3863-2

THE TOXIC EFFECTS OF MIXTURES OF SEVERAL OIL PRODUCTS AND OIL-SPILL EMULSIFIERS THE GROWTH OF SKELETONEMA COSTATUM WERE COMPARED WITH THAT OF INDIVIDUAL OIL PRODUCTS AND OIL-SPILL EMULSIFIERS. THE FOLLOWING RESULTS WERE OBTAINED: THE TOX OF ALL THE MIXTURES TESTED IS FAR HIGHER THAN THAT OF INDIVIDUAL OIL-SPILL EMULSIFIERS, BUT IS SIMILAR TO OR SLIGHTLY HIGHER THAN THAT OF THE CORRESPONDING INDIVIDUAL OIL PRODUCTS.

THE IMPACT OF CRUDE OIL AND OIL DISPERSANTS ON THE MARINE OLIGOCHAETE MARIONINA SUBTERRANEA . - 80-08 84873

GIERE, O.

CAH. BIOL. MAR., 21(1), 51-60 (1979) LANGUAGE(S)- GERMAN, ENGLISH, FRENCH AFFILIATION- (ZOOL. INST. AND ZOOL. MUS., UNIV. HAMBURG, MARTIN-LUTHER-KING-PLAT D-2000 HAMBURG 13, GFR) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0030-1949-2

SURVIVAL OF THE UBIQUITOUS MARINE INTERSTITIAL OLIGOCHAETE M. SUBTERRANEA (ENCHYTRAEIDAE) IN SHORT-TERM EXPERIMENTS WITH ARABIAN LIGHT CRUDE OIL CORRESP WITH THE FAIRLY HIGH RESISTANCE OF THE SPECIES IN FIELD STUDIES: CONCENTRATIONS 1000 PPM CRUDE HAD ONLY LITTLE NEGATIVE EFFECT, WHEREAS PURE SOLUTIONS OF THE OLD-TYPE DISPERSANT MARLOPHEN 86.2 F WERE HIGHLY TOXIC EVEN AT LOW CONCENTRATIO THEIR TOXICITY WAS SOMEWHAT LOWERED IN DISPERSIONS WITH CRUDE OIL. WITH MODERN A (COREXIT 7664, FINASOL OSR-2 AND OSR-5) MORTALITY WAS USUALLY VERY LOW, BUT INCREASED IN MIXTURES WITH OIL. COMBINATIONS OF SEVERAL MODERN DISPERSANTS SEEM CAUSE SYNERGISTIC TOXICITY. BASED ON THESE RESULTS, THE EFFECTS OF OIL SPILLS ON CONDITIONS OF LITTORAL MEIOFAUNA ARE CONSIDERED.

THE CONTAINMENT OF AN OIL SLICK BY A BOOM PLACED ACROSS A UNIFORM STREAM. - 80-08

DI PIETRO, N. D. COX, R. G.

J. FLUID MECH., 96(3), 613-640 (1980) LANGUAGE(S)- ENGLISH AFFILIATION: (SNC/FOSTER WHEELER LTD., 1 COMPLEX DESJARDINS, MONTREAL, QUE., CANADA) TY JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0030-1162-6

A SMALL REGION (CALLED THE SURFACE TENSION REGION) WHERE PRESSURE DIFFERENCES AC THE OIL-WATER AND OIL-AIR INTERFACES ARE IMPORTANT IS SHOWN TO EXIST BETWEEN THE GRAVITY VISCOUS AND MONOLAYER REGIONS OF A SPREADING OIL SLICK (DI PIETRO, HUH A COX 1978). THE IMPORTANCE OF THIS NEW REGION IS THAT (I) IT IS NECESSARY IN ORDE CONNECT THE GRAVITY-VISCOUS AND MONOLAYER REGIONS AND (II) IT IS A REGION WHERE SLOPES OF INTERFACES ARE LARGE. THIS IDEA IS USED TO FIND THE THICKNESS PROFILE OF OIL LAYER CONTAINED UPSTREAM OF A BARRIER (AN OIL BOOM) PLACED ACROSS A CHANNEL WHICH WATER IS FLOWING AT A CONSTANT VELOCITY. THE ASSUMPTION IS ALSO MADE THAT VELOCITY DIFFERENCE ACROSS THE OIL LAYER IS SMALL COMPARED WITH THE WATER VELOCI THE GENERAL CONDITIONS FOR THE VALIDITY OF THE RESULTS ARE THEN DISCUSSED TOGETH WITH THE MODIFICATIONS TO THE THEORY WHICH ARE NECESSARY IF THE BOUNDARY LAYER I

THE ELEMENTS OF THE WARREN SPRING LABORATORY RESEARCH AND DEVELOPMENT PROGRAMME ON OIL SPILL RECOVERY AT SEA ARE SET OUT. THE RANGE OF SKIMMERS AND BOOMS TESTED AT SEA IS DESCRIBED AND PRINCIPLES AND CRITERIA FOR SELECTION PRESENTED AGAINST THAT BACKGROUND. IT IS THEN SHOWN HOW THESE PRINCIPLES AND CRITERIA HAVE BEEN USED TO DESIGN AND DEVELOP THE SPRINGSWEEP OIL RECOVERY SYSTEM, DETAILS OF WHICH ARE PRESENTED AS AN EXAMPLE OF THE IMPLEMENTATION OF THE PRINCIPLES AND CRITERIA. IT IS CONCLUDED THAT THIS APPROACH CAN BE USED TO GIVE GUIDANCE IN THE SELECTION OF NEW PROJECTS FOR RESEARCH AND DEVELOPMENT SUPPORT AND TO SELECT EQUIPMENT ALREADY AVAILABLE, FOR TRIALS AT SEA.

PROTECTION, CLEANUP AND RESTORATION OF SALT MARSHES ENDANGERED BY OIL SPILLS: A PROCEDURAL MANUAL. - 80-06 00835

MAIERO, D. J. CASTLE, R. W. CRAIN, O. L.

PUBL. BY: URS; SAN MATEO, CA (USA). NOV, 1978. 167 P. URS-7004-05-01. CONTRACT EPA-68-03-2160. LANGUAGE(S)- ENGLISH, NORWEGIAN CORP. AUTH- UNITED RESEARCH SERVICES, SAN MATEO, CA (USA). TYPE- REPORT NDN- 032-0028-257-4

DECISION MAKING CRITERIA ARE PROVIDED FOR BOTH THE PROTECTION AND CLEANUP. SPECIAL ATTENTION IS GIVEN TO THE CLEANUP PHASE WHICH INVOLVES FOOT AND VEHICULAR TRAFFIC IN THE MARSH AND WHICH MAY LEAD TO SERIOUS ADVERSE IMPACTS. THE USER IS PRESENTED WITH CRITERIA FOR TERMINATION OF ACTIVITIES FOR BOTH PROTECTION AND CLEANUP ACTIVITIES. RECOVERY INCLUDES EVALUATION OF THE NEED FOR RESTORATION VERSUS NATURAL RECOVERY. AN RESTORATION TECHNIQUES.

POLLUTION FEATURE: SLOWLY GETTING MATTERS RIGHT. - 80-06 65611

SHIPP. WORLD SHIPBUILD., 172(3959), 829, 831 (1979) LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0028-0342-0

FOLLOWING THE DISASTROUS OIL POLLUTION YEAR OF 1978, THE SEACOP CONFERENCE WAS SPONSORED BY THE UK DEPARTMENT OF TRADE TO DEAL WITH INEFFICIENCIES IN ANTI-POLLUTIO OPERATIONS AROUND THE UK COASTLINE. GOVERNMENT PROPOSALS OUTLINED AT THE CONFERENCE WERE: (1) GOVERNMENT ASSISTANCE CAN BEST BE ORGANISED BY A UNIT ON THE SPOT IN CONSULTATION WITH LOCAL AUTHORITIES; (2) LOCAL AUTHORITIES SHOULD CONTINUE TO CARRY OUT BEACH CLEANING; (3) BEACH CLEANING PLANS AND THE DEPARTMENT OF TRANSPORT'S SEA OPERATIONS SHOULD BE COMPATIBLE. THE ARTICLE NOTES THAT SEACOP DEALT ONLY WITH CONTAINMENT AND REMOVAL OF OIL. PREVENTION OF POLLUTION IS ALSO ESSENTIAL, HOWEVER, AND THERE MUST BE ADEQUATE DETERRENTS TO PREVENT TANKER CAPTAINS FROM DELIBERATELY DISCHARGING SLOPS. THE WORKINGS OF THE TANKER OWNER'S VOLUNTARY AGREEMENT CONCERNING LIABILITY FOR OIL POLLUTION (TOVALOP) AND THE CONTRACT REGARDING AN INTERIM SUPPLEMENT TO TANKER LIABILITY FOR OIL POLLUTION (CRISTAL) ARE DESCRIBED. IN A SPEEC TO THE TANKER OWNERS COMPENSATION SCHEME C.P. SRIVASTAVA OF IMCO SUGGESTED 4 AREAS IN WHICH ACTION BY TANKER OWNERS WOULD REDUCE POLLUTION. THESE WERE: (1) EFFECTIVE IMPLEMENTATION OF LOAD ON TOP SYSTEMS; (2) RATIFICATION OF FURTHER REGULATIONS ADOPTED BY IMCO; (3) PROVISION OF ADEQUATE SHORE FACILITIES; (4) REGIONAL CO-OPERATION TO COMBAT POLLUTION.

INTERACTION BETWEEN POLYCYCLIC AROMATIC HYDROCARBONS, CRUDE OIL AND OIL DISPERSANTS IN THE SALMONELLA MUTAGENESIS ASSAY. - 80-05 54568

PETRILLI, F. L. DE RENZI, G. P. DE FLORA, S.

CARCINOGENESIS, 1(1), 51-56 (1980) LANGUAGE(S)- ENGLISH AFFILIATION- (INST. HYG., UNIV. GENOA, VIA PASTORE 1, 16132 GENOA, ITALY) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0027-0118-0

MUTAGENICITY ASSAYS WERE CARRIED OUT IN THE SALMONELLA/MICROSOME TEST, USING 5 S. TYPHIMURIUM HIS - STRAINS (TA1535, TA1537, TA1538, TA98 AND TA100), BOTH IN THE PRESENCE AND ABSENCE OF POST-MITOCHONDRIAL PREPARATIONS FROM AROCLOR-INDUCED RAT LIVERS AND SUITABLE CO-FACTORS. SEVEN OIL DISPERSANTS SHOWED A WIDE RANGE OF TOXICIT TOWARDS THE BACTERIAL STRAINS, WITHOUT ELICITING ANY MUTAGENIC RESPONSE AT SUB-LETHA CONCENTRATIONS. ONE SAMPLE OF CRUDE OIL AND ITS DIMETHYLSULPHOXIDE (DMSO) EXTRACT WERE ALSO NEGATIVE, AND NO MUTAGENIC EFFECT COULD BE DETECTED BY CHECKING MIXTURES O CRUDE OIL WITH EACH OF THE SEVEN DISPERSANTS TESTED. TWO POLYCYCLIC AROMATIC HYDROCARBONS, BENZO(A)PYRENE (BP) AND BENZ(A)ANTHRACENE (BA), WHICH ARE GENERALLY CONSIDERED TO BE THE MOST DOCUMENTED CARCINOGENIC COMPONENTS OF CRUDE OIL, WERE MUTAGENIC WITH A FRAMESHIFT MECHANISM, REQUIRING METABOLIC ACTIVATION. BP MUTAGENICITY WAS NOT AFFECTED BY OIL DISPERSANTS NOR BY SEAWATER. CONVERSELY, THE MUTAGENICITY OF BP DMSO-SOLUTIONS WAS ABOLISHED IN THE PRESENCE EITHER OF WHOLE CRUD OIL OR ITS DMSO EXTRACT, OR OF CRUDE OIL/DISPERSANT MIXTURES. THESE LOSSES OF MUTAGENICITY COULD BE MAINLY ASCRIBED TO A MECHANICAL TRAPPING OF BP BY OIL COMPONENTS.

COMBINED DREDGER - 80-05 54661

DOCK HARBOUR AUTH., 60(706), 175, (1979) LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0027-0025-4

FOLLOWING THE SIGNING OF A CONTRACT WITH THE NETHERLANDS STATE WATERWAYS BOARD, A CONSORTIUM OF DUTCH DREDGING CONTRACTORS PLACED AN ORDER IN JULY 1979 FOR THE FIRST SLICKTRAIL TRAILING DREDGER/OIL RECOVERY VESSEL. THE VESSEL WILL HAVE A HOPPER CAPACITY OF 5 375 M 3, WILL BE 118 M LONG, WITH A BEAM OF 18.7 M, DEPTH OF 9 M, LAW DRAFT OF 7.8 M AND SPEED OF 13 KNOTS. THE SLICKTRAIL COMBINES A LARGE OIL RECOVERY VESSEL WITH A TRAILING SUCTION HOPPER DREDGER SO THAT THE CRAFT MAY BE FINANCIALLY VIABLE ALL YEAR. THE VESSEL WILL BE USED FOR MAINTENANCE OF COASTAL WATERS AND HARBOUR ACCESS CHANNELS, EXCEPT IN TIMES OF AN OIL SPILL EMERGENCY IN THE DUTCH SECTOR OF THE NORTH SEA.

EFFECTS OF THREE OIL SPILL DISPERSANTS ON MARINE BACTERIAL POPULATIONS. 1. PRELIMINARY STUDY. QUANTITATIVE EVOLUTION OF AEROBES. - 80-05 57982

MARTY, D. BIANCHI, A. CATELLIER, C.

MAR. POLLUT. BULL., 10(10), 285-287 (1979) LANGUAGE(S)- ENGLISH AFFILIATION- (LAB. MICROBIOL. MILIEU MAR., UNIV. PROVENCE, 3 PLACE VICTOR HUGO, 13331 MARSEILLE CEDEX 3, FRANCE) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0026-6704-4

THE EFFECTS OF 3 HYDROCARBON DISPERSANT AGENTS (COREXIT 9527, HYDROGAMOSOL LT AND OS LT 126) ON THE BACTERIAL FLORA OF THE MARINE ENVIRONMENT ARE ANALYSED IN 20 M 2 BASINS FILLED WITH LAGOON SEAWATER. FOUR MONTHS AFTER THE FIRST TREATMENT, OIL SLICKS WERE NO LONGER VISIBLE, WHEREAS THE APPEARANCE OF THE UNTREATED REFERENCE SLICK HAD HARDLY CHANGED. THE TREATMENT OF 10 L CRUDE-OIL SLICKS CAUSES AN APPRECIABLE AND LONG LASTING INCREASE IN THE BACTERIAL POPULATION.

ASSESSMENT OF THE ACUTE AND SUB-LETHAL EFFECTS OF VARIOUS POLLUTANTS ON SELECTED MARINE ORGANISMS AND THE FATE OF PETROLEUM HYDROCARBONS IN AN ESTUARY SUBJECTED TO A REFINERY EFFLUENT. - 80-05 02343

WHITE, I. C.

IN: FINAL REPORTS ON RESEARCH SPONSORED UNDER THE FIRST ENVIRONMENTAL RESEARCH PROGRAMME (INDIRECT ACTION). COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOUR (LUXEMBOURG) 1978. P. 382-385 ISBN 92-825-0185-X. LANGUAGE(S)- ENGLISH TYPE- BOOK : CHAPTER NDN- 032-0026-1186-5

BRIEF DETAILS OF TESTS TO ASSESS THE ACUTE TOXICITY OF OIL DISPERSANT PRODUCTS MIXED WITH OIL ON CRANGON CRANGON, THE EFFECT OF OIL DISPERSANT ON PATELLA VULGATA, AN THE SUB-LETHAL EFFECTS OF MARINE POLLUTANTS ON CREPIDULA FORNICATA ARE PRESENTED. THE FATE OF PETROLEUM HYDROCARBONS IN SOUTHAMPTON WATER, AN AREA SUBJECTED TO REFINERY EFFLUENT, WAS INVESTIGATED, WITH REFERENCE TO THEIR DISTRIBUTION IN COMMERCIAL SPECIES OF MARINE ORGANISMS.

DISTRIBUTION OF HYDROCARBONS AMONG OIL, WATER AND VAPOR PHASES DURING OIL DISPERSANT TOXICITY TESTS. - 80-04 48036

BOBRA, A. MACKAY, D. SHIU, W. Y.

BULL. ENVIRON. CONTAM. TOXICOL., 23(4-5), 558-565 (1979) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. CHEM. ENG. AND APPL. CHEM., UNIV. TORONTO, TORONTO, ONT., M5S 1A4, CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0025-5171-6

A MAJOR CONSIDERATION IN DETERMINING THE DESIRABILITY OF USING DISPERSANTS TO CLEAR OILSPILLS IS THE EXTENT TO WHICH THE DISPERSANT ALTERS THE EXPOSURE OF WATER ORGANISMS TO THE OIL. TO ASSESS THE TOXICITY AND ENVIRONMENTAL RISK IT IS NECESSARY TO CALCULATE THE DISTRIBUTION OF SPECIFIC HYDROCARBONS BETWEEN THE OIL PHASE, THE AQUEOUS PHASE AND THE VAPOUR PHASE DURING A TOXICITY TEST. THREE FACTORS ARE INVOLVED IN THESE TESTS, THE EFFECT OF THE DISSOLVED HYDROCARBON, THE EFFECT OF DISPERSED OIL PARTICLES AND THE EFFECT OF THE DISPERSANT CHEMICAL, EACH BEING DEPENDENT ON DIFFERENT FACTORS OF CONCENTRATION, SIZE, ETC. A SET OF EQUATIONS HAS BEEN DERIVED TO PERMIT CALCULATION OF THE PARTITION OF A HYDROCARBON, BETWEEN THE VARIOUS PHASES, TO BE USED IN THE DESIGN OF TOXICITY TESTS.

Dr. Mullins send page to Kim

CYCLIC FLUCTUATIONS IN POPULATION DENSITY DURING ELEVEN YEARS RECOLONISATION OF ROCKY SHORES IN WEST CORNWALL FOLLOWING THE TORREY CANYON OIL-SPILL IN 1967. - 80-04 02136

SOUTHWARD, A. J.

IN: CYCLIC PHENOMENA IN MARINE PLANTS AND ANIMALS. NAYLOR E.; HARTNOLL R.G. (EDS.) PUBL. BY: PERGAMON PRESS: OXFORD (UK) 1979 P. 85-92 ISBN 0-08-023217-5 LANGUAGE(S)- ENGLISH AFFILIATION- MAR. BIOL. ASSOC. UK., CITADEL HILL, PLYMOUTH, DEVON PL1 2PB, UK) TYPE- BOOK : CHAPTER NDN- 032-0025-0760-0

THE LARGE-SCALE MORTALITIES CAUSED BY THE TOXIC DISPERSANTS USED TO CLEAN-UP THE TORREY CANYON OIL-SPILL WERE FOLLOWED BY CYCLES OF DOMINANCE OF A FEW ABUNDANT SPECIES WHICH INTERACTED WITH EACH OTHER. THE DOMINANTS, IN ORDER OF APPEARANCE WERE: EPHEMERAL GREEN ALGAE; SPECIES OF FUCUS; THE LIMPET PATELLA VULGATA; AND THE BARNACLES CHTHAMALUS SPP AND BALANUS BALANOIDES. RETURN TO A MORE NORMAL PATTERN OF DIVERSITY, A SMALL-SCALE MOSAIC OF COMPETING SPECIES OF MANY DIFFERENT AGE-GROUPS, TOOK 8 TO 10 YEARS OR MORE. CHANGES IN THE LIMPET POPULATION DURING THE TRANSITION FROM ALGAL DOMINANCE TO GREATER DIVERSITY SUGGEST THE LATTER SYSTEM HAS GREATER PERMANENT STOCKING CAPACITY FOR GRAZERS. THE APPARENT STABILITY OF THE OPEN OCEANIC ROCKY INTERTIDAL COMMUNITY IN CORNWALL IS ILLUSORY, AND BETTER REGARDED AS A STATE OF DYNAMIC EQUILIBRIUM BUILT-UP OVER MANY YEARS, AND EASILY DISTORBED BY HUMAN INTERFERENCE.

BOOMS USED FOR OIL SLICK CONTROL. - 80-03 40874

LAU, Y. L. MOIR, J.

PROC. AM. SOC. CIV. ENG., J. ENVIRON. ENG. DIV., 105(EE2), 369-382 (1979) LANGUAGE(S)- ENGLISH AFFILIATION- (ENVIRON. HYDR. SECT., HYDR. RES. DIV., NATL. WATER RES. INST., BURLINGTON, ONT., CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0024-1991-7

EXPERIMENTS WERE CONDUCTED TO DETERMINE THE CONDITIONS FOR NO CONTAINMENT OF OIL BY BOOM, THE OIL-WATER INTERFACIAL FRICTION COEFFICIENT AND THE MAXIMUM ANGLE WHICH A BOOM CAN BE ANGLED TO THE FLOW TO DEFLECT AN OIL SLICK. THE CRITERION THAT THE DENSIMETRIC FROUDE NUMBER HAS TO BE SMALLER THAN ABOUT 0.5 FOR CONTAINMENT WAS VERIFIED. IN ADDITION, A NEW CRITERION WAS DISCOVERED WHICH SPECIFIES A MINIMUM BOOM DRAUGHT. THE LOCAL VALUE OF THE INTERFACIAL FRICTION COEFFICIENT WAS EVALUATED ALONG THE SLICK USING MEASURED SLICK PROFILES, AND WAS FOUND TO DECREASE ALONG THE LENGTH OF A SLICK. THE FRICTION COEFFICIENT ALSO INCREASED WITH INCREASING OIL VISCOSITY. BASED ON THE EXPERIMENTAL RESULTS, AN EMPIRICAL RELATIONSHIP WAS DERIVED FOR THE MAXIMUM ANGLE AT WHICH A BARRIER COULD BE ANGLED TO THE FLOW TO COMPLETELY DIVERT AN OIL SLICK.

EFFECTS OF COREXIT 9527 ON THE HATCHABILITY OF MALLARD EGGS. - 80-03 40928

ALBERS, P. H.

BULL. ENVIRON. CONTAM. TOXICOL., 23(4/5), 661-668 (1979) LANGUAGE(S)- ENGLISH AFFILIATION- (US FISH AND WILDL. SERV., PATUXENT WILDL. RES. CENT., LAUREL, MD 20811 USA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0024-1938-3

THE EFFECTS OF THE OIL DISPERSANT COREXIT 9527, CRUDE OIL AND THE TWO TOGETHER ON ANAS PLATYRHYNCHOS EMBRYOS WERE INVESTIGATED BY APPLICATION TO THE SURFACE OF EGGS NEAR THE AIR CELL. EGGS WHICH DID NOT HATCH WERE EXAMINED TO FIND THE STAGE AT WHICH DEVELOPMENT HAD BEEN ARRESTED. ALL TREATED GROUPS HAD REDUCED HATCHING SUCCESS COMPARED TO CONTROL GROUPS. TOXICITY WAS IN THE ORDER COREXIT:OIL OF 1:5>OIL>COREXIT:OIL OF 1:30 AND SIMILAR RESULTS WERE FOUND FOR THE STAGE OF DEVELOPMENT AT WHICH EMBRYOS DIED. COREXIT 9527 APPLIED TO THE EGG AT A POINT WHERE THE EMBRYO WAS CLOSE TO THE SHELL RESULTED IN DEATH WITHIN 24 H. HATCHING WEIGHTS WERE NOT AFFECTED BY TH TREATMENTS. NO GROSS EXTERNAL MALFORMATION OR BEHAVIOURAL ABNORMALITIES WERE SEEN.

AERIAL APPLICATION OF DISPERSANTS IN BANTRY BAY FOLLOWING THE BETELGEUSE INCIDENT. - 80-01 25225

NICHOLS, J. A. WHITE, I. C.

MAR. POLLUT. BULL., 10(7), 193-197 (1979) LANGUAGE(S)- ENGLISH AFFILIATION (INT. TANKER OWNERS POLLUT. FED. LTD., PLANTATION HOUSE, 31-35 FENCHURCH ST., LONDON EC3M 3DX, UK) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0021-1014-1

FOR THE FIRST TIME DURING A SIGNIFICANT OIL SPILL, AIRCRAFT WERE USED IN PREFERENCE TO SURFACE VESSELS TO APPLY CHEMICAL DISPERSANTS, FOLLOWING THE TRAGIC ACCIDENT TO THE FRENCH REGISTERED TANKER IN BANTRY BAY, SOUTH-WEST EIRE. IN THIS PARTICULAR CASE WITH AN IDEALLY SITUATED LANDING STRIP, CLOSE TO THE SOURCE OF THE SPILL OF FRESH CRUDE OIL, THE RESPONSE PROVED TO BE HIGHLY EFFECTIVE AND PREVENTED THE VAST MAJORITY OF THE OIL LOST AFTER THE 6TH DAY FROM REACHING THE NEARBY SHORELINES. THE ABILITY O

THE PILOT OF THE SPRAY AIRCRAFT TO RAPIDLY LOCATE AND TO SELECT FOR TREATMENT ONLY THOSE SLICKS OR PARTS OF SLICKS POSING A SIGNIFICANT THREAT ALSO RESULTED IN THE MINIMUM AMOUNT OF DISPERSANT BEING USED TO MAXIMUM EFFECT.

THE EFFECTS OF OIL DISPERSANTS ON MARINE EGGS AND LARVAE. - 79-10 12971

LONNING, S. FALK PETERSEN, I. B.

ASTARTE, 11(2), 135-138 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (INST. BIOL. AND GEOL., UNIV. TROMSO, N-9001 TROMSO, NORWAY) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0018-6973-9

THE EFFECTS OF THE OIL DISPERSANTS COREXIT 7664, 9527, 9600, BP 1100 X, 1100 WD, A FINASOL OSR2, OSR5, AND OSR7 WERE TESTED ON EGGS AND LARVAE FROM SEA URCHINS AND MARINE FISHES, ON NAUPLII AND ON SOME OTHER PLANKTON ORGANISMS. A COMPARISON OF T DIFFERENT DISPERSANTS SHOWS THAT THE CONCENTRATES COREXIT 9527 AND FINASOL OSR5 AN OSR7 PRODUCE MOST EFFECTS IN ALL TYPES OF EXPERIMENTS. A COMPARISON OF VARIOUS ORGANISMS AND STAGES SHOWS THAT THE FERTILIZATION PROCESS OF SEA URCHINS AND THE EARLY DEVELOPMENT OF FISH ARE PARTICULARLY SENSITIVE TO OIL DISPERSANTS. HOWEVER, EFFECTS ARE OBTAINED IN ALL KINDS OF EXPERIMENTS, NOT ONLY WITH LARVAE, BUT ALSO W ADULT PLANKTON ORGANISMS (MEDUSAE AND COPEPODS).

TREATMENT OF OIL CONTAMINATED WASTE WATERS BY FOAM FRACTIONATION. - 79-09 90315

MATHEWS, A. BISHNOI, P. R. SVRCEK, W. Y.

WATER RES., 13(4), 385-391 (1979) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP CHEM. ENG., UNIV. CALGARY, CALGARY, ALBERTA T2N 1N4, CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0018-7108-9

A LABORATORY INVESTIGATION WAS CARRIED OUT TO DETERMINE THE APPLICABILITY OF A FOA SEPARATION PROCESS TO REMOVE ORGANIC POLLUTANTS FROM WASTE WATER. THE EFFECT OF TH OPERATING VARIABLES NAMELY AIR FLOW RATE, SURFACTANT FLOW RATE, PRESSURE, PH AND CONCENTRATION OF THE SOLID ADSORBENT WERE STUDIED FOR DIFFERENT FEED STREAMS. IT W FOUND THAT FOAM SEPARATION ALONE COULD ACHIEVE 98% REMOVAL OF OIL FROM A WASTE STRE CONTAINING EMULSIFIED OIL IN WATER. THE THREE PHASE FLUIDIZED BED ADSORPTION PROCE YIELDED 98% REDUCTION OF ORGANICS IN THE TWO INDUSTRIAL WASTE WATERS TESTED. THE RESULTS OF A COST STUDY CARRIED OUT TO ESTABLISH THE FEASIBILITY OF USING A SIMILA PROCESS ON AN INDUSTRIAL SCALE ARE ALSO PRESENTED.

A TOXICOLOGICAL EVALUATION OF A PLASTIC OIL ABSORBANT. - 79-08 81199

LONNING, S. HAGSTROM, B. E.

MAR. POLLUT. BULL., 9(10), 276-278 (1978) LANGUAGE(S)- ENGLISH AFFILIATIO (INST. BIOL. AND GEOL., UNIV. TROMSO, N-9001 TROMSO, NORWAY) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0017-8679-7

THE EFFECT OF A PLASTIC OIL ABSORBANT WAS TESTED ON SEVERAL DIFFERENT TEST ORGANISM OF DIFFERENT TAXONOMIC POSITIONS. THE RESULTS INDICATE THAT THE OIL KILLER UNDER TH EXPERIMENTAL CONDITIONS DESCRIBED, ACTS AS AN ALMOST INERT NONTOXIC SUBSTANCE. THE OIL KILLER DISSOLVES IN THE PRESENCE OF METHYLENE CHLORIDE BUT IN SPITE OF THIS NO NEGATIVE EFFECTS WERE RECORDED. IN COMBINATION WITH CRUDE OIL THE OIL KILLER SEEMS RATHER TO REDUCE THE SERIOUS ILL EFFECTS EXERTED BY OIL ALONE.

EFFECTS OF INSECTICIDES, OIL DISPERSANTS AND SYNTHETIC DETERGENT ON THE EMBRYONIC DEVELOPMENT IN MEDAKA, ORYZIAS LATIPES . - 79-06 61751

HIROSE, K. KAWAKAMI, K.

BULL. TOKAI REG. FISH. RES. LAB., (NO. 91), 9-17 (1977) LANGUAGE(S)- ENGLISH; JAPANESE AFFILIATION- (ADDRESS NOT STATED) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0016-2328-8

THIS STUDY WAS UNDERTAKEN TO DETERMINE THE EFFECTS OF INSECTICIDES (DDT, PAP AND DIAZINON), OIL DISPERSANTS (NO. 2 AND NO. 5) AND LAS ON THE EMBRYONIC DEVELOPMENT IN MEDAKA, O. LATIPES. IN THE FERTILIZED EGGS EXPOSED TO DDT (0.04, 0.004 AND 0.0004 PPM) EMBRYONIC DEVELOPMENT WAS RETARDED. TIME FROM FERTILIZATION TO HATCHING INCREASED TO 15.8-17.8 DAYS. IN 0.01 PPM OF PAP EMBRYONIC DEVELOPMENT WAS SOMEWHAT RETARDED, WHEREAS IN 1 PPM GROUP, THE HATCHING RATE WAS 50% AND DEFORMED LARVAE WERE OBSERVED. THE EMBRYONIC DEVELOPMENT IN DIAZINON WAS SIMILAR TO THAT IN THE CONTROL, BUT HATCHING RATES WERE REDUCED IN 5 AND 1 PPM OF DIAZINON. NO. 2 DID NOT AFFECT THE DEVELOPING EMBRYOS, WHEREAS NO. 5 SHOWED A SEVERE EFFECT. IN 5000 PPM OF NO. 5 AL THE EMBRYOS WERE DEAD DURING THE INCUBATION AND IN THE 10 PPM GROUP, THE EMBRYOS DID NOT HATCH. THE FERTILIZED EGGS WERE DEAD AFTER A DAY IN 10 PPM OF LAS. IN 5 AND 2 PP OF LAS THEIR HATCHING RATES WERE ALSO REDUCED. HEART RATE IN 5 PPM OF LAS SHOWED A TENDENCY TO INCREASE FOR THE PERIOD OF EXPERIMENT. HOWEVER, IN 5 PPM OF DIAZINON THE HEART RATE SHOWED THE PEAK 9 DAYS FROM FERTILIZATION, FOLLOWED BY GRADUAL DECREASE.

THE EXPERIMENT WAS ALSO CARRIED OUT TO KNOW WHETHER SOME OBSERVED ABNORMAL RESPONSES TO THE SUBLETHAL EFFECT OF PAP, DIAZINON, WO, 3 AND LAS WERE DUE TO THE PERIOD OF INCUBATION OR DUE TO THE EFFECT FOLLOWED BY HATCHING. IN ORDER TO KNOW THE SUBLETHAL EFFECT OF POLLUTANT ON EMBRYONIC DEVELOPMENT IN FISH, IT IS BETTER TO OBSERVE NOT ONLY EMBRYONIC DEVELOPMENT BUT ALSO HATCHING RATE, MEAN DAY FROM FERTILIZATION TO HATCHING AND BEHAVIOUR IN LARVAE. BASED ON THE RESULT OF THIS STUDY, IT SEEMS THAT 4 H TLM X 1/10 OR 1/100 IS A SAFE CONCENTRATION FOR THE EMBRYONIC DEVELOPMENT OF MEDAKA.

THE EFFECTS OF BUNKER C OIL AND AN OIL DISPERSANT: PART 2 -- EFFECTS ON THE ACCUMULATION OF CHLORINE-LABELLED BUNKER C OIL IN VARIOUS FISH TISSUES.- 79-06 63709

MCKEOWN, B. A. MARCH, G. L.

MAR. ENVIRON. RES., 1(2), 119-123 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. BIOL. SCI., SIMON FRASER UNIV., BURNABY, BC, CANADA V5A 1S6) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0016-0627-8

CHLORINE-LABELLED BUNKER C OIL WAS USED TO MEASURE THE DIFFERENTIAL ACCUMULATION IN VARIOUS FISH TISSUES BETWEEN A HYDROCARBON AND A HYDROCARBON/OIL DISPERSANT MIXTURE. THERE IS AN INCREASED MOMENT OF THE EMULSIFIED OIL ACROSS THE GILL STRUCTURE ALTHOUG ACCUMULATION BY THIS TISSUE IS SIMILAR FOR BOTH TEST CONDITIONS. THE LIVER AND KIDNE SHOWED SIGNIFICANLY HIGHER LEVELS OF THE OIL/DISPERSANT MIXTURE WHEREAS MUSCLE ACCUMULATIONS WERE LESS DRAMATIC. THE AMOUNTS OF BUNKER C FOUND IN THE GILLS, LIVER AND KIDNEY WERE CONSIDERABLY HIGHER THAN THAT FOUND IN THE MUSCLE. CONSIDERATION WAS GIVEN TO THE VARYING CAPABILITY OF THE BLOOD TO CARRY POLAR, COMPARED WITH NON-POLAR COMPOUNDS.

BANTRY BAY SKIMMER. - 79-04 00731

CATALLOZZI, E. R.

SEA FRONT., 24(4), 237-239 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (ADDRES NOT STATED) TYPE- JOURNAL ARTICLE NDN- 032-0014-5887-3

THE AUTHOR DESCRIBES A 68-FOOT, $1 MILLION VESSEL CAPABLE OF CLEANING UP OCEAN OIL SPILLS AT THE RATE OF 500 GALLONS/MINUTE WHICH HAS RECENTLY BEEN PUT INTO SERVICE IN BANTRY BAY, IRELAND. THE VESSEL, BAY SKIMMER, IS THE LARGEST OIL RECOVERY VESSEL BUILT IN THE UNITED STATES. IT HAS THE ABILITY TO RECOVER OIL FROM THE OCEAN ALMOST TOTALLY WATER FREE, <1%, WHICH MEANS THAT THE RECOVERED OIL IS USABLE AGAIN. ALSO, A SPEEDS OF 1-2 KNOTS, THE VESSEL CAN PICK UP >90% OF THE OIL IN A SINGLE PASS. BAY SKIMMER USES THE DIP CONEPT TO COLLECT OIL FROM WATER (DYNAMIC INCLINED PLANE) WHICH COLLECTS OIL BY FORCING IT UNDER THE SURFACE OF THE WATER. OIL FOLLOWS THE SURFACE OF THE MOVING INCLINED PLANE TO A COLLECTION WELL UNDERNEATH THE UNIT. BUOYANT FORCES CAUSE THE OIL TO NATURALLY SEPARATE IN THE WELLS WHERE IT FORMS A DEE OIL POCKET. WATER FREE OIL IS THEN PUMPED FROM THE TOP OF THE WELL TO STORAGE.

NEW PROCEDURES FOR THE TOXICITY TESTING OF OIL SLICK DISPERSANTS IN THE UNITED KINGDOM. - 79-04 01741

BLACKMAN, R. A. A. FRANKLIN, F. L. NORTON, M. G. WILSON, K. W.

MAR. POLLUT. BULL., 9(9), 234-238 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (FISH. LAB., BURNHAM-ON-CROUCH, ESSEX, UK) TYPE- JOURNAL ARTICLE : ABSTRACT NDN- 032-0014-5484-3

UNDER THE DUMPING AT SEA ACT 1974 THE USE OF OIL SLICK DISPERSANTS REQUIRES A LICENC FROM THE MINISTRY OF AGRICULTURE, FISHERIES AND FOOD IN ENGLAND AND WALES. THESE LICENCES ARE ISSUED OR REFUSED ON THE BASIS OF TESTS TO ASSESS THE TOXICITY OF THE DISPERSANT WHEN USED AT SEA OR ON BEACHES. THE RATIONALE BEHIND THE DEVELOPMENT OF THE TWO TOXICITY TESTS (THE SEA TEST AND THE BEACH TEST) USED, TOGETHER WITH THE TES METHODS ADOPTED AND THE RESULTS OF THE TESTS, ARE DESCRIBED.

THE SEA URCHIN EGG AS A TEST OBJECT IN OIL POLLUTION STUDIES. - 79-04 01750

LONNING, S.

RAPP. P.-V. REUN. CONS. INT. EXPLOR. MER., 171, 186-188 (1977) LANGUAGE(S)- ENGLISH AFFILIATION- (INST. BIOL. GEOL., UNIV. TROMSO, N-9000 TROMSO, NORWAY) TYPE- JOURNAL : CONFERENCE PROCEEDINGS NDN- 032-0014-5475-2

A FEW EXAMPLES ARE TAKEN FROM THE LITERATURE (MAINLY THE AUTHOR'S OWN STUDIES) TO ILLUSTRATE THE USE OF SEA URCHIN (STRONGYLOCENTROTUS PALLIDUS AND ECHINOCYAMUS PUSILLUS) GAMETES AND EMBRYOS AS TEST MATERIAL IN OIL POLLUTION STUDIES: FERTILIZATION (RATE, EFFECT ON NUCLEUS AND CYTOPLASM); DEVELOPMENT (EFFECTS ON SKELETON AND INVAGINATION OF THE INTESTINE). IN GENERAL, OIL DISPERSANTS SEEM TO BE MUCH MORE HARMFUL THAN CRUDE OIL.

THE ACUTE EFFECT OF BUNKER C OIL AND AN OIL DISPERSANT ON: 1 SERUM GLUCOSE, SERUM SODIU AND GILL MORPHOLOGY IN BOTH FRESHWATER AND SEAWATER ACCLIMATED RAINBOW TROUT (SALMO GAIRDNERI). - 78-12 02874

MCKEOWN, B. A., MARCH, G. L.

WATER RES., 12(3), 157-163 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. BIOL. SCI., SIMON FRASER UNIV., BURNABY, B. C. V5A 1S6, CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NON- 032-0010-0508-8

BUNKER C OIL AND AN OIL DISPERSANT WERE TESTED FOR PHYSIOLOGICAL STRESS ON BOTH FRESHWATER AND SALTWATER ACCLIMATED RAINBOW TROUT. BOTH COMPOUNDS TENDED TO REDUCE SERUM GLUCOSE LEVELS WITH BUNKER C CAUSING THE MORE SIGNIFICANT DECREASE ($P<0.08$), INDICATING A POSSIBLE DYSFUNCTION OF THE KIDNEY. THE FRESHWATER TREATMENT GROUP SHOWED A SIGNIFICANT DECREASE IN SODIUM LEVELS ($P<0.01$) WHEN TREATED WITH A DISPERSANT, WHILE UNDER SIMILAR CONDITIONS, SALTWATER ACCLIMATED FISH SHOW A VERY MARKED INCREASE IN SERUM SODIUM CONCENTRATIONS ($P<0.025$). THOSE FLUCTUATIONS IN SODIUM LEVELS ARE RESULTANT FROM DIRECT INTERFERENCE WITH THE ENERGY ACTIVATED SODIU TRANSPORT SYSTEMS OF THE GILLS. MICROPHOTOGRAPHS OF GILL FILAMENTS AND LAMELLAE SHOW SEVERE DAMAGE CAUSED BY THE DISPERSANT AND DISPERSANT/OIL MIXTURE WITH LESS IMPAIRMENT RESULTANT FROM BUNKER C EXPOSURE.

TOXICITY TESTING WITH SYNCHRONIZED CULTURES OF THE GREEN ALGA CHLAMYDOMONAS . - 78-11 87355

NORLAND, S. HELDAL, M. LIEN, T. KNUTSEN, G.

CHEMOSPHERE, 7(3), 231-245 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (INST. GEN. MICROBIOL., UNIV. BERGEN, ALLEGT. 70, 5014 N BERGEN, NORWAY) TYPE- JOURNA ARTICLE: ORIG. RESEARCH NON- 032-0008-4232-0

THE AUTHORS OUTLINE THE MAIN FEATURES OF THE SYNCHRONOUS CULTURE OF CHLAMYDOMONAS REINHARDTII AND DESCRIBE ITS USE IN BIOASSAYS FOR THE DETECTION OF SUBSTANCES TOXIC TO ALGAE. SYNCHRONIZATION OF SPORULATION IS ACHIEVED BY THE INTERMITTENT ILLUMINATION/CULTURE DILUTION PRINCIPLE. DATA ON THE MEAN SPORULATION TIME, RELATIVE PROGENY NUMBERS, AVERAGE SPORE NUMBER, DRY WEIGHT INCREASE, TOTAL PROTEIN CONTENT AR PRESENTED IN GRAPH FORM. THE DATA PRESENTED SHOW THAT THIS CELL SYSTEM IS SIMPLE TO MANAGE, REPRODUCIBLE AND ACCURATE. THE CHLAMYDOMONAS SYSTEM WAS TESTED BY STUDYING THE TOXICITY OF THE OIL DISPERSANT COREXIT 9527. THE RESULTS AND THEIR INTERPRETATIO ARE DISCUSSED. COREXIT 9527 HAD AN ESTIMATED EC-50 575 PPM. THE VALUE OF THIS CHLAMYDOMONAS SYSTEM IN TOXICITY TESTING IS SUMMARISED.

ACUTE TOXICITY OF SEVERAL OIL DISPERSANTS TOWARDS THE GREEN ALGAE CHLAMYDOMONAS AND DUNALIELLA . - 78-11 87356

HELDAL, M. NORLAND, S. LIEN, T. KNUTSEN, G.

CHEMOSPHERE, 7(3), 247-255 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (INST. GEN. MICROBIOL., UNIV. BERGEN, ALLEGT. 70, 5014 N BERGEN, NORWAY) TYPE- JOURNA ARTICLE: ORIG. RESEARCH NON- 032-0008-4231-8

SEVERAL OIL DISPERSANTS WERE TESTED ON CHLAMYDOMONAS REINHARDTII AND DUNALIELLA MARINA. TOXICITY TESTING WAS PERFORMED WITH 3 TYPES OF TESTS - A PLATE TEST, A TUBE TEST USING SYNCHRONOUSLY CULTURED CHLAMYDOMONAS, AND A TUBE TEST WITH EXPONENTIALL GROWN DUNALIELLA CULTURES. THE RESULTS OF THESE TESTS USING 12 DISPERSANTS ARE PRESENTED IN TABULAR FORM. IN ANOTHER TABLE THE EFFECTS OF MIXTURES OF EKOFISK CRUDE OIL WITH DISPERSANTS IN A 1:1 RATIO ON BOTH SPECIES ARE PRESENTED AND THE COMPOUNDS ARE GROUPED ACCORDING TO THE LOWEST CONCENTRATION WHICH KILLED ALL CELLS OF THE TEST POPULATION.

THE EFFECTS OF CRUDE OIL AND THE DISPERSANT, OILSPERSE 43, ON RESPIRATION AND COUGHING RATES IN ATLANTIC SALMON (SALMO SALAR). - 78-10 71453

BARNETT, J. TOEWS, D.

CAN. J. ZOOL., 56(2), 307-310 (1978) LANGUAGE(S)- ENGLISH, FRENCH AFFILIATION- (DEP. BIOL., ACADIA UNIV., WOLFVILLE, NS, CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NON- 032-0007-8122-6

EMULSIONS OF VENEZUELAN CRUDE OIL AND THE DISPERSANT, OILSPERSE 43, IN BOTH UNWEATHERED AND ARTIFICIALLY WEATHERED FORMS, INCREASED THE COUGHING RATE OF POST SMOLT ATLANTIC SALMON (S. SALAR L.) IN FRESH WATER AT SUBLETHAL CONCENTRATIONS RANGING FROM 0.01 TO 0.7 TOXIC UNITS IN 12-H TESTS. COUGHING RATES INCREASED SIGNIFICANTLY IN WHAT APPEARED TO BE A CONCENTRATION- AND TIME-RELATED BASIS WHILE RESPIRATION RATES DECLINED AT THE HIGHER SUBLETHAL LEVELS. AT MOST CONCENTRATIONS TESTED, THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN THE PHYSIOLOGICAL RESPONSES IN EITHER UNWEATHERED OR ARTIFICIALLY WEATHERED EMULSIONS.

OIL SPILL DISPERSANTS CAUSE BRADYCARDIA IN A MARINE FISH. - 78-10 72743
KICENIUK, J. W. PENROSE, W. R. SQUIRES, W. R.

MAR. POLLUT. BULL., 9(2), 42-45 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. FISH. ENVIRON., FISH. MAR. SERV., RES. AND RESOUR. SERV., 3 WATER ST., ST. JOHN'S, NEWFOUNDLAND, A1C 1A1, CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0007-7085-0

THE SYMPTOMS OF DETERGENT POISONING HAVE BEEN OBSERVED TO BE SIMILAR TO THOSE OF ASPHYXIC HYPOXIA. IF HYPOXIA IS IN ANY WAY INVOLVED IN THE TOXICITY OF DETERGENTS SUBLETHAL PHYSIOLOGICAL EFFECTS OF THE DETERGENTS IN OIL DISPERSANTS WOULD BE EXPECTED TO BE SIMILAR TO THE EFFECT OF HYPOXIA ALONE. WHEN SUBJECTED TO HYPOXIA FI DECREASE THEIR HEART RATE AND INCREASE THE VENTILATION VOLUME. HEART RATE IN FISH PRECISELY CONTROLLED AND COMPENSATED. THIS STUDY WAS UNDERTAKEN ON TAUTOGOLABRUS ADSPERSUS TO DETERMINE (A) WHETHER HEART RATE OF A MARINE FISH IS AFFECTED BY OIL DISPERSANTS AND IF SO, (B) WHAT COMPONENTS OF OIL DISPERSANTS ARE EFFECTIVE IN PRODUCING THE RESPONSE, AND (C) AT WHAT RELATIVE CONCENTRATIONS. IT WAS FOUND THAT OIL DISPERSANTS CAUSE BRADYCARDIA IN FISH SIMILAR TO THE EFFECT OF HYPOXIA. THE BRADYCARDIA IS SUSTAINED FOR THE DURATION OF EXPOSURE AND IS REVERSIBLE. ONLY THE SURFACTANT FRACTION OF DISPERSANTS PRODUCED THE EFFECT, AND ALL SURFACTANTS TESTED HAD THE SAME EFFECT, DIFFERING ONLY IN THE THRESHOLD CONCENTRATIONS. THE OBSERVED LATENT PERIOD IS A MIXING ARTIFACT SINCE PERFUSION OF DILUTED SURFACTANTS DIRECTLY INTO THE MOUTH OF A FISH PRODUCED AN IMMEDIATE BRADYCARDIA (WITHIN ONE HEART BEAT PERIOD) WHICH WAS SUSTAINED FOR THE PERIOD OF PERFUSION. THE RETURN TO NORMAL HEART RATE AFTER DOSING WAS SLOWER THAN THE INITIATION OF THE RESPONSE BUT WAS NEVERTHELESS MUCH FASTER (<5 MIN) THAN THE CLEARANCE TIME FOR NONIONIC DETERGENT IN FISH (8 H TO SEVERAL DAYS). THIS RAPID REVERSIBILITY SUGGESTS THAT THE OBSERVED EFFECT IS THE RESULT OF A REVERSIBLE ACTION ON A PERIPHERAL SITE, SUCH AS A SENSORY RECEPTOR OR GILL EPITHELIUM.

THE CLEAN-UP OF OIL SPILLS FROM UNPROTECTED WATERS. - 78-09 03101

MILGRAM, J.

OCEANUS, 20(4), 86-94 (1977) LANGUAGE(S)- ENGLISH AFFILIATION- (MIT. DEP. OCEAN. ENG., CAMBRIDGE, MA 02139, USA) TYPE- JOURNAL ARTICLE: REVIEW NDN- 032-0007-0976-0

DESPITE THE TECHNOLOGICAL ADVANCES IN THE PAST 10 YEARS IT IS STILL IMPOSSIBLE TO CLEAN UP MORE THAN A FEW PERCENT OF THE OIL IN ANY MAJOR OIL SPILL. MUCH TECHNOLOGY HAS BEEN DEVELOPED FOR THE SMALLER SPILLS AND IS STILL BEING IMPROVED. THERE IS LITTLE QUESTION ABOUT THE ADVISABILITY OF DEVELOPING AND USING THIS TECHNOLOGY. MORE QUESTIONS EXIST AS TO WHAT SHOULD BE DONE ABOUT LARGE SPILLS IN UNPROTECTED WATERS. FIVE CLINICAL ITEMS ARE NEEDED IN A TOTAL SPILL CLEAN-UP SYSTEM: (1) A BASIC WAVE-FOLLOWING OIL BARRIER THAT CAN PROVIDE THE NEEDED SWEEPING WIDTH AND SERVE AS AN OIL THICKNESS CONCENTRATOR; (2) OIL COLLECTION DEVICES (SKIMMERS) TO ACTUALLY COLLECT THE OIL FROM THE POOL CONTAINED BY THE BARRIER; (3) AN OIL STORAGE VESSEL INTO WHICH THE COLLECTED OIL CAN BE PUMPED AND THEN STORED; (4) TOWING VESSELS THAT CAN MANOEUVER THE ARRANGEMENT OF BARRIER, SKIMMER, AND STORAGE VESSEL THROUGH AN OIL SLICK AT A SWEEPING SPEED OF 1-2 KNOT; AND FINALLY (5) HIGHLY TRAINED PERSONNEL. IF SINGLE ONE OF THESE ITEMS IS ABSENT NO OIL CAN BE CLEANED UP. IN ADDITION SUPPORTING EQUIPMENT AND FACILITIES ARE NEEDED TO DELIVER, LAUNCH AND LATER RECOVER BARRIERS AND SKIMMERS. SHORESIDE FACILITIES ARE NEEDED TO RAPIDLY OFFLOAD AND LATER PROCESS OR DISPOSE OF RECOVERED OIL. DUE TO THE HIGH COST OF MAINTAINING SUCH SYSTEMS A DECISION NEEDS TO BE MADE AS TO WHETHER OR NOT THE IMPLEMENTATION OF TOTAL SPILL CLEAN-UP SYSTEMS SHOULD TAKE PLACE.

EFFECTS OF CRUDE OILS AND THE OIL DISPERSANT COREXIT ON PRIMARY PRODUCTION OF ARCTIC MARINE PHYTOPLANKTON AND SEAWEED. - 78-09 64780

HSIAO, S. I. C. KITTLE, D. W. FOY, M. G.

ENVIRON. POLLUT., 15(3), 209-221 (1978) LANGUAGE(S)- ENGLISH AFFILIATION- (ARCTIC BIOL. STN., ENVIRON. CANADA, FISH. AND MAR. SERV., PO BOX 400, STE. ANNE DE BELLEVUE, P.Q., CANADA) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0006-8342-3

EFFECTS OF CRUDE OIL AND COREXIT ON PRIMARY PRODUCTION OF ARCTIC MARINE PHYTOPLANKTON WERE STUDIED IN SITU. THE PRODUCTION RATE VARIED WITH TYPES AND CONCENTRATIONS OF CRUDE OIL, METHOD OF PREPARATION OF OIL-SEAWATER MIXTURES, ENVIRONMENTAL CONDITIONS AND SPECIES COMPOSITION OF EACH SAMPLE TESTED. IN SAMPLES WITH THE SAME SPECIES COMPOSITION, INHIBITION OF PRODUCTION GENERALLY INCREASED WITH INCREASING OIL CONCENTRATION. THE CRUDE OIL-COREXIT MIXTURES WERE MORE TOXIC THAN CRUDE OIL OR COREXIT ALONE. IN SITU PRIMARY PRODUCTION OF THE SEAWEEDS, LAMINARIA SACCHARINA (L.) LAMOUROUX AND PHYLLOPHORA TRUNCATA (P.) NEWROTH ET TAYLOR WAS SIGNIFICANTLY INHIBITED BY ALL TYPES AND CONCENTRATIONS OF OIL TESTED.

SOIL RESTORATION FOLLOWING OIL SPILLS - A REVIEW. - 78-05 01404
MCGILL, W.

J. CAN. PET. TECHNOL., 16(2), 60-67 (1977) LANGUAGE(S)- ENGLISH AFFILIATION- (DEP. SOIL SCI., ALBERTA INST. PEDOL., UNIV. ALBERTA, EDMONTON, ALTA., CANADA) TYPE- JOURNAL ARTICLE : REVIEW NDN- 032-5003-2436-8

AN AVERAGE OF 1-2 OIL SPILLS OCCUR IN ALBERTA PER DAY, MOST OF THESE ARE ON LAND. ALTHOUGH MANY STUDIES HAVE BEEN CONDUCTED INTO THE EFFECTS OF OIL ON PLANTS AND WATER, ONLY A LIMITED NUMBER HAVE DEALT WITH SOIL. THIS PAPER SUMMARIZES OUR INFORMATION ON SOIL RESTORATION FOLLOWING OIL SPILLS. THE DEVELOPMENT OF OUR UNDERSTANDING OF OIL SPILL EFFECTS ON SOIL IS REVIEWED TOGETHER WITH THE EARLY LITERATURE EXAMINING SITE RESTORATION. RECENT RESTORATION RESEARCH IS DEALT WITH IN DETAIL AND THE ADVANTAGES OF VARIOUS TECHNIQUES ARE DISCUSSED. NON-BIOLOGICAL MECHANISMS OF OIL REMOVAL FROM SOIL, SUCH AS VOLATILIZATION, BURNING AND PHOTODECOMPOSITION, ARE EXAMINED FIRST, FOLLOWED BY BIOLOGICAL RESTORATION PROCEDURES. THE EFFECTIVENESS OF VARIOUS TECHNIQUES DEPENDS ON THE TYPE OF OIL, AMOUNT OF OIL AND SOIL ENVIRONMENT. UP TO 40% OF THE RESIDUAL OIL LEFT AT A SITE AFTER INITIAL CLEAN-UP CAN BE REMOVED THROUGH NON-BIOLOGICAL MECHANISMS, PRIMARILY VOLATILIZATION. BIOLOGICAL RESTORATION IS REQUIRED TO DEAL WITH MUCH OF THE REMAINDER. BIOLOGICAL RESTORATION GENERALLY REQUIRES NUTRIENT ADDITIONS, AERATION, MAINTENANCE OF A NEUTRAL PH, TILLAGE OR MIXING TO BREAK SURFACE CRUSTS AND SOME FORM OF DRAINAGE IN VERY WET SPOTS. PROPER IMPLEMENTATION OF THESE TECHNIQUES CAN INCREAS THE RATE OF RESTORATION BY SEVERAL FOLD AND SOMETIMES AN ORDER OF MAGNITUDE.

OIL-WATER SEPARATION AND THE IMCO PERFORMANCE TEST SPECIFICATION FOR SEPARATORS. - 78-0 23156

CORMACK, D. PARKER, H. WALSH, T.

TRANS. INST. MAR. ENG. SER. A, 89(1), 20-28 (1977) LANGUAGE(S)- ENGLISH AFFILIATION- (ADDRESS NOT STATED) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0002-8891-1

OIL-WATER SEPARATOR PERFORMANCE IS DISCUSSED IN TERMS OF THE IMCO TEST SPECIFICATION THE SALIENT POINTS OF THE SPECIFICATION, THE TEST RIG AND THE TEST SEQUENCES ARE PRESENTED. ANALYTICAL RESULTS OBTAINED FOR OIL CONTENTS OF SHIPBOARD SAMPLES OF BILG AND FUEL TANK BALLAST WATER ARE GIVEN TO SHOW THE TYPICAL RANGE OF OIL CONTENT LIKEL TO BE ENCOUNTERED IN PRACTICE. THERE FOLLOWS A DISCUSSION OF THE PERFORMANCE RESULTS OF SEPARATORS APPLIED TO THESE TYPICAL OIL CONTENTS BOTH ON SHIPS AND IN THE LABORATORY. SEPARATORS IN BOTH THESE SITUATIONS FALL SHORT OF IMCO REQUIREMENTS OF < 100 PPM OIL IN THE FINAL EFFLUENT. THE GENERAL PROPERTIES OF DISPERSIONS AND THE PROBLEMS OF SEPARATION ARE THEN DISCUSSED AND THE REASONS FOR THE POOR PERFORMANCE GIVEN IN TERMS OF THE PRESENCE OF SECONDARY DISPERSIONS PRODUCED BY PASSING THE OIL AND WATER THROUGH THE PUMPS, THESE SECONDARY DISPERSIONS BEING INCAPABLE OF SEPARATION BY MEANS OF GRAVITY ALONE. THE RESULTS OF CONTROLLED ASSESSMENT OF SEPARATORS TO THE IMCO TEST SPECIFICATION ARE THEN PRESENTED. THESE RESULTS CONFIRM THE PRESENCE OF SECONDARY DISPERSIONS PRODUCED BY THE PUMPS AND THAT GRAVITY SEPARATORS OF THEMSELVES CANNOT MEET THE IMCO REQUIREMENTS. THE NEED FOR SECONDARY COALESCERS AND FILTERS TO DEAL WITH THE SECONDARY DISPERSIONS IS DEMONSTRATED AND TH SUCCESS OF SUITABLY DESIGNED DEVICES OF THIS TYPE IS RECORDED. THROUGHOUT, RESULTS ARE DISCUSSED IN TERMS OF SEPARATOR EVALUATION ON THE ONE HAND AND THE ASSESSMENT OF THE IMCO SPECIFICATION ON THE OTHER. FINALLY, OVERALL CONCLUSIONS ARE REACHED REGARDING CURRENT TECHNOLOGY AND THE DEMANDS OF THE IMCO TEST SPECIFICATION.

OIL SPILL PREVENTION AND RECOVERY. - 78-04 11334

POLLUT. MONIT., (NO.37), 39 (1977) LANGUAGE(S)- ENGLISH TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0001-3937-1

THREE SYSTEMS ARE BRIEFLY DESCRIBED FOR OIL SPILL PREVENTION AND RECOVERY. FOR THE CONTINUOUS MONITORING OF OIL IN BILGE AND BALLAST WATER, THE OILI OIL CONTENT METER IS DESCRIBED. THERE IS A RANGE OF MACHINES WHICH CAN RECOVER ANIMAL, MINERAL OR VEGETABLE OIL WITH A MAXIMUM WATER CONTENT OF 15%. FINALLY A COMPACT CONTAINER HAS BEEN DEVELOPED FOR CARRYING ALL THE NECESSARY OIL POLLUTION CONTROL EQUIPMENT.

CHARACTERISTICS OF SUSPENSIONS OF KUWAIT OIL AND COREXIT 7664 AND THEIR SHORT- AND LONG-TERM EFFECTS ON TISBE BULBISETOSA (COPEPODA: HARPACTICOIDA). - 78-04 12215

DALLA VENEZIA, L. FOSSATO, V.

MAR. BIOL., 42(3), 233-237 (1977) LANGUAGE(S)- ENGLISH AFFILIATION- (IST. BIOL. MARE, CNR, RIVA SETTE MARTIRI 1364/A, 30122 VENEZIA, ITALY) TYPE- JOURNAL ARTICLE: ORIG. RESEARCH NDN- 032-0001-3188-8

A TECHNIQUE FOR PREPARING SEAWATER SUSPENSIONS OF KUWAIT OIL AND COREXIT WAS DEVELOPED. THE RESULTING HYDROCARBON CONCENTRATIONS WERE ANALYSED BY GAS-CHROMATOGRA PHY AND SPECTROFLUOROMETRIC METHODS AND THE STABILITY OF THE SUSPENSIONS WITH TIME