

Waste Treatment/Disposal Plan for Laboratory Works

In order to carry out the laboratory works in health and safety, laboratory staff should keep the following rules:

Extremely hazardous wastes should be converted (oxidized, reduced, neutralized, etc) to less dangerous substance before being placed in containers.

Most waste disposal companies require the segregation and identification of all liquid wastes by type.

Laboratory Practices for Waste Disposal

- Always consult your supervisor and the MSDS (Material Safety Data Sheets) before attempting to dispose of waste chemicals..
- Segregate wastes in clearly marked safety containers to avoid any possible chemical reaction. Always consider the possibility of spontaneous reactions, explosions, and fire.
- Protect maintenance, janitorial, shipping, and other personnel. When working with extremely dangerous materials, always monitor your waste disposal step by step to their final disposition.
- Minimize the discharge of waste.

Heavy Metals, general (Cd, Pb, As, Cu, Fe, Zn, Mn, Cr(III), etc.)

- Mineralize the organic compounds
- Store in a container under acid condition

(desirable treatment)

Treat by precipitating as hydroxide (see Note A)

Hexavalent Chromium

- Store under the sulfuric acid condition, < pH3
- After reduction by sodium sulfide, store in the container with heavy metals

Mercury

- Disintegrate the organic mercury with acid
- Store in a container independently

(desirable treatment)

Treat by activated carbon or chelation (see Note B)

Cyanide

- Store in alkaline by NaOH, > pH12
- Decompose CN into N₂ and CO₂ by adding sodium hypochlorite
- Neutralize with sulfuric acid or hydrochloric acid

Organic Solvents, Oil

- Protect from spontaneous reactions, evaporation, and fire
- Propose to recover and reuse
- Treat by incineration

Acid, Alkali

- Neutralize by each other then dilute

Apparatus used with bacillus test

- Sterilized before dispose

Note A: Treatment of heavy metals by precipitating as hydroxide

- 1) add FeCl₃ or Fe₂(SO₄)₃, mix thoroughly
- 2) add Ca(OH)₂ slurry, adjust pH to 9 – 11
- 3) after settling the precipitation, filter the solution
- 4) discard filtrate after confirmation the absence of heavy metals

Note B: Treatment of mercury by activated carbon or chelation

- 1) if the solution contains more than 1ppm Hg, add FeSO₄ solution and Na₂S, mix thoroughly under pH 6 – 8
- 2) after settling the precipitation, filter the solution
- 3) after adding NaCl, let the filtrate pass through activated carbon or chelate resin column to remove the remaining Hg

Daily report of Laboratory work

Date	15 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al Zawad</p> <p>Qusai Bohlaiqah <i>Qusai M.</i></p> <p>Alam Nizami <i>[Signature]</i></p> <p>Jamal Kazim <i>[Signature]</i></p> <p>Yoshitaka Imaeda <i>[Signature]</i></p> <p>Hiroyuki Oi <i>[Signature]</i></p> <p>Mamoru Sato <i>[Signature]</i></p>
Subjects	<p>Meeting</p> <p>Schedule of 4th stage</p> <p>Confirmation of delivery of equipment and chemicals, and trouble shooting</p>

Details	<p>Meeting</p> <p>Schedule of 4th stage</p> <p>Schedule of laboratory work</p> <p>Equipment in laboratory (for Jamal)</p> <p>Analysis items (for Jamal)</p> <p>Confirmation of other items</p> <p>Delivery of purchased items</p> <p>Troubles of equipment (AAS, Milli-Q)</p>
	<p>Attached document(s)</p> <p>-Itinerary of team</p>

Daily report of Laboratory work

Date	16 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al Zawad</p> <p>Qusai Bohlaiah</p> <p>Alam Nizami</p> <p>Jamal Kazim</p> <p>Yoshitaka Imaeda</p> <p>Hiroiyuki Oi</p> <p>Mamoru Sato</p>
Subjects	<p>Personnel plan in laboratory</p> <p>Items, person in charge</p> <p>General explanation</p> <p>Method, equipment, apparatus, principal</p>

Details	<p>Personnel plan in laboratory</p> <p>Items, person in charge</p> <p>General explanation of methods</p> <p>Equipment, apparatus</p> <p>Method</p> <p>Principal</p> <p>Chemicals</p> <p>Preparation of GC</p> <p>Health and safety</p> <p>Attached document(s)</p> <p>-Personnel plan in laboratory</p>
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Personnel Plan in Laboratory

16-May-00

Analysis Parameter	Pre-treatment	Method	Person in Charge	
			JICA	MEPA
Total Coliform	filtration/cultivation	M-endo	Sato	Jamal
TOC	Purge CO ₂	TOC meter		
TOC (sediment)	decomposition	Titrimetric		
Metals				
Mg	dillution	AAS		
Cd,Co,Cu,Ni,Pb,Zn,Cr	extraction	AAS		
As	decomposition	hydride/AAS	Imaeda	Alam
Hg	decomposition	vapor/AAS		
V (sediment)	decomposition	AAS		
Total P	decomposition	SP		
Cyanogen	distillation	SP		
Phenols	distillation	SP		
Oil & Grease	extraction	Oil meter	Ohi	Qusai
TPH	extraction	Oil meter		
TSS	filtration	Gravimetric		
Ignition Loss	ignition in furnace	Gravimetric		
Chlorophyll	filtration/extraction	SP		
TKN	decomposition/distillation	SP		
NH3	distillation	SP		
BTEX	head space sampler	GC		

Daily report of Laboratory work

Date	20 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>A</i></p> <p>Jamal Kazim <i>JK</i></p> <p>Yoshitaka Imaeda <i>YI</i></p> <p>Hiroyuki Oi <i>HO</i></p> <p>Mamoru Sato <i>MS</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, Ammonium, Phosphorus and Phenol</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Sterilize method</p> <p>Procedure</p> <p>Ammonium (Qusai)</p> <p>Distillation method</p> <p>Phosphorus (Alam)</p> <p>Preparation of chemicals</p> <p>Phenol (Alam)</p> <p>Preparation of chemicals</p> <p>Health and Safety plan (Jamal)</p> <p>Attached document(s)</p> <p>Procedures (coliform, nitrogen)</p>
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Ammonia (NH₃) – SM 4500-NH₃ B,F

Spectrophotometric Method

[Apparatus]

- Steamed-out Distillation apparatus
- Test Tube with stopper (50 ml) or Conical Beaker
- Spectrophotometer

[Chemicals]

- ① Sulfuric Acid (25 m mol/L)

sulfuric acid 1.4 ml → 1000 ml

- ② Borate buffer solution

NaOH(4g/L) 88 ml + sodium tetraborate(Na₂B₄O₇ 9.5g/L) 500ml → 1000 ml

- ③ Phenol-Sodium Pentacyanonitrosylferrate (Sodium Nitroprusside) Solution:

Phenol	5 g	→ 500 ml
Sodium Pentacyanonitrosylferrate	0.025 g	

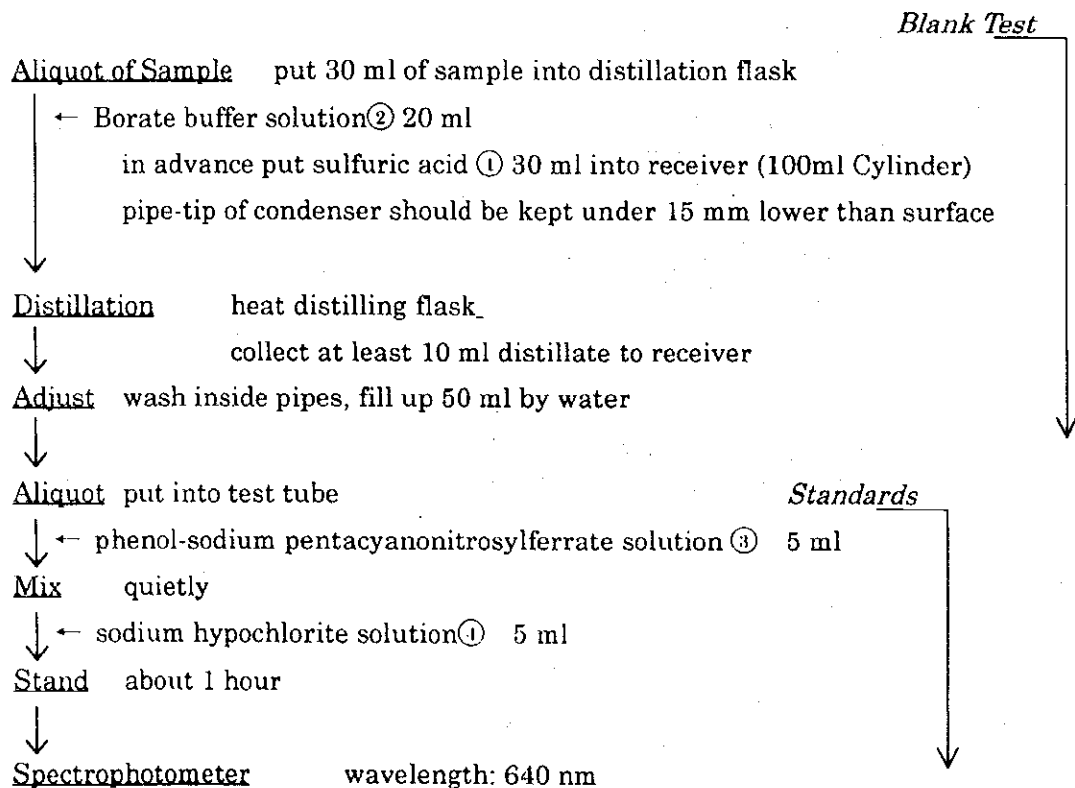
- ④ Sodium Hypochlorite solution(0.1 w/v%)

Sodium hypochlorite(5%) 2 ml + NaOH 3 g → 100 ml

- ⑤ Ammonia Standard solution (100 µg/ml)

Ammonium Chloride 0.3819 g → 1000 ml

[Operation Flow]



System sterilization

(At beginning of each working day)

1. Sterilization of pump

If the pump has remained unused for 2 days or more, proceed 3. prior to this section.

(1) Remove the cover and wipe the surface of filter support and cover with gauze moistened with ethanol.

(2) Take 400ml MilliQ water to 500ml beaker and place the sanitization tubing in it.

(3) Place the cover onto each filter support.

(4) Press the ON/OFF button to start the pump. Run the pump for 10 seconds. Press the ON/OFF button to stop the pump.

(5) Confirm the VACUUM RELEASE lamp will come off.

(6) Repeat the process (4) 5 times

(7) Remove the sanitization tubing, then repeat (4).

(8) Remove the sanitization tubing from water.

(Before proceed each sample)

2. Sterilization of filter support

Wipe filter support with gauze moistened with 70 – 80% ethanol solution.

(At the end of each working day)

3. Sterilization of pump

At the end of each working day, and at the begging of the week, pump must be sanitized.

(1) Prepare 250ppm sodium hypochlorite solution.

Take 2ml of 5% sodium hypochlorite solution into 500ml beaker and dilute up to 400ml with MilliQ water.

(2) Switch on the pump with ON/OFF switch.

(3) Place the cover onto each filter support.

(4) Connect the tubing to the connection on the back of pump.

(5) Place the other end of the tubing into a 500ml beaker.

(6) Press the ON/OFF button to start the pump. Run the pump for 10 seconds. Press the ON/OFF button to stop the pump.

(7) Repeat the process (6) 5 times.

(8) Leave the pump for next working day.

Daily report of Laboratory work

Date	21 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>Alam</i></p> <p>Jamal Kazim <i>Jam</i></p> <p>Yoshitaka Imaeda <i>Yosh</i></p> <p>Hiroyuki Oi <i>HO</i></p> <p>Mamoru Sato <i>(MS)</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, Ammonium, Phenol and Phosphorus</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Preparation of chemicals</p> <p>Blank test</p> <p>Handling of pipette (Jamal)</p> <p>TOC (Jamal)</p> <p>Operatoin of equipment</p> <p>Preparation of chemicals</p> <p>NH3 (Qusai)</p> <p>Distillation</p> <p>Blank test</p> <p>Phosphorus (Alam)</p> <p>Calibration</p> <p>Blank test</p> <p>Phenol (Alam)</p> <p>Calibration</p> <p>Blank test</p> <p>Distillation</p> <p>Attached document(s)</p> <p>Coliform</p>
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Coliform analysis

(system sterilization)

(1) At the beginning of each working day, proceed system sterilization 1.

(filtration of sample)

(2) proceed system sterilization 2.

(3) Remove protective cover from filter support.

(4) Remove the Milliflex-100 funnel from its packing tray.

A spacer is left in the tray.

(5) Place the spacer on the filter support by sterile forceps.

(6) Firmly press the funnel into the filter support.

(7) Remove the cover from funnel and pour 100ml (diluted) sample into the funnel.

Leave the cover loose over the funnel.

(8) Press ON/OFF button to start a pump for filtering the sample.

(9) After filtration of sample, press ON/OFF button to switch off the pump.

(10) Place the cover onto the funnel firmly.

(preparation of medium cassette)

(11) Remove the yellow cap from cassette.

(12) Open the ampoule of EC medium by pressing the top of ampoule.

(13) Transfer the EC medium into the cassette.

(14) After complete transfer of medium, firmly attach the yellow cap on the cassette.

(15) Remove the paper cover from the liquid medium cassette.

(incubation)

(16) Remove funnel from filter support and place the funnel base down over the exposed liquid medium cassette.

(17) Remove the spacer from filter support and replace the cover onto the filter support.

(18) Press down on the top of the funnel with the palm of hands.

Increase gradually hand pressure until the funnel breaks off.

(19) Remove the cover from the funnel and place over the top of the filter cassette assembly.

(20) Incubate upside down in the incubator at 35.5°C for 48 hours.

(counting)

(21) Count the number of colonies by microscope.

Daily report of Laboratory work

Date	22 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>Alam</i></p> <p>Jamal Kazim <i>J.K.</i></p> <p>Yoshitaka Imaeda <i>Y.I.</i></p> <p>Hiroyuki Oi <i>H.O.</i></p> <p>Mamoru Sato <i>M.S.</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, TOC, Ammonium and Phosphorus</p> <p>Maintenance program</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Blank test</p> <p>TOC (Jamal)</p> <p>Operation of equipment</p> <p>Preparation of standard solution</p> <p>Dilution procedure for solution (Jamal)</p> <p>Weighing procedure (Jamal)</p> <p>Handling of micro-pipette</p> <p>NH3 (Qusai)</p> <p>Distillation</p> <p>Blank test</p> <p>GC</p> <p>Preparation for standard solution</p> <p>Phosphorus (Alam)</p> <p>Calibration</p> <p>Blank test</p> <p>Comparison of EPA and US standard method</p> <p>Maintenance program</p> <p>Mr. Ahmed Al Dalouj will prepare maintenance plan for laboratory equipment</p> <p>Attached document(s)</p> <p>Preparation for laboratory work (maintenance)</p>
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Maintenance

(1) Equipment list (Ahmed)

(2) Maintenance program

Daily maintenance program

Monthly maintenance program

Other routinely maintenance program

Maintenance procedure

Maintenance record (check sheet)

GC [KIAK](Ahmed)

AAS [NSC](Ghazi)

UV [KIAK](Ahmed)

pH meter [KIAK](Ghazi)

TOC [KIAK](Ahmed)

Oil content meter [Labomatic](Ghazi)

Autoclave [KIAK](Ghazi)

Centrifuge [Labomatic](Ahmed)

Millipore [IDCO](Ghazi)

Trouble shooting record (Ghazi)

(3) Safety information

Safety information for electricity and high pressure cylinder (Ghazi)

Safety information for equipment

Analysis

(1) Operation procedure manuals for routine work

GC (Oi)

AAS (Alam)

TOC (Sato)

Oil content meter (Qusai)

pH meter (Najib)

UV (Sato)

Autoclave (Qusai)

Centrifuge (Najib)

Milli-Q (Alam)

(2) Analysis procedures

Coliform (Alam)

Others (Oi and Sato)

Daily report of Laboratory work

Date	23 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>Alam</i></p> <p>Jamal Kazim <i>JK</i></p> <p>Yoshitaka Imaeda <i>YI</i></p> <p>Hiroyuki Oi <i>HO</i></p> <p>Mamoru Sato <i>MS</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, TOC, BTEX and Phenol</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Counting colonies</p> <p>Sample preparation method</p> <p>Calculation</p> <p>TOC (Jamal)</p> <p>Operation of equipment</p> <p>Sample preparation method</p> <p>GC (Qusai)</p> <p>Preparation for standard solution</p> <p>Calibration</p> <p>Phenol (Alam)</p> <p>Calibration</p> <p>Preparation of calibration curve by computer</p> <p>Blank test</p> <p>Solvent extraction</p> <p>Attached document(s)</p> <p>Procedure (BTEX)</p>
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BTEX (Benzene, Toluene, Ethylbenzene and Xylene)

Gas-chromatographic Method

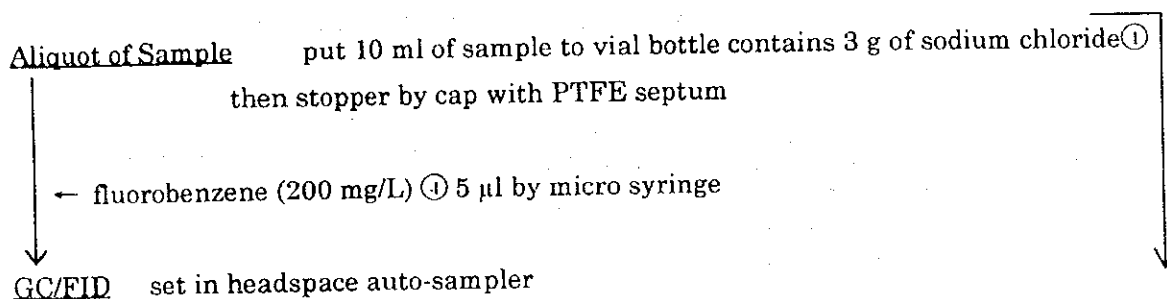
[Apparatus]

- GC-FID with headspace auto-sampler
- Vial bottle (20 ml)
- Aluminum cap with PTFE septum
- Microsyringe

[Chemicals]

- ① Sodium Chloride
- ② Methanol
- ③ Mixed reference solution for BTEX (2 mg/ml for each)
- ④ Fluorobenzene (200 mg/L): store in refrigerator

[Operation Flow]

Blank Test Standards*(Blank Sample)*

10 ml of water

(Standard Curve)

Working Solution: dilute 1 ml of reference solution③ to 10 ml with methanol (200 mg/L)

→ store in refrigerator

in advance, add 3 g of sodium chloride① and 10 ml of water to vial bottle

add fluorobenzene (200 mg/L) ④ 5 µl by micro syringe

add 5 and 10 µl of working solution by micro syringe

add volume (µl) concentration(mg/L)

1 0.02

2 0.04

5 0.10

Daily report of Laboratory work

Date	24 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai A.</i></p> <p>Alam Nizami <i>AN</i></p> <p>Jamal Kazim <i>JK</i></p> <p>Yoshitaka Imaeda <i>Y.I.</i></p> <p>Hiroyuki Oi <i>HO</i></p> <p>Mamoru Sato <i>MS</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, TOC, AAS, BTEX, CN and Oil and Grease</p> <p>Meeting with BeeA'h</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Counting</p> <p>TOC (Jamal)</p> <p>Operation of equipment</p> <p>Sample preparation</p> <p>AAS (Jamal)</p> <p>Operation of equipment</p> <p>GC (Qusai)</p> <p>Preparation for standard solution</p> <p>Calibration</p> <p>CN (Alam)</p> <p>Discussion about measurement procedure</p> <p>Oil and Grease (Alam)</p> <p>Discussion about solvent extraction procedure</p> <p>Meeting with BeeA'h</p> <p>Analysis results in last stage</p> <p>Trace analysis of metal in seawater</p> <p>Attached document(s)</p> <p>Meeting memorandum</p>
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Daily report of Laboratory work

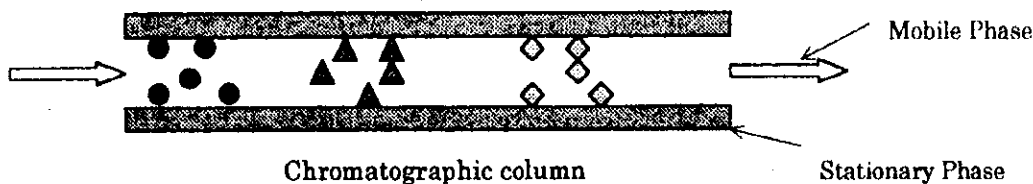
Date	27 May, 2000
Attendance	(initial of attendance) Hashim Al-Zawad Qusai Bohlaiah <i>Qusai M.</i> Alam Nizami <i>Alam</i> Jamal Kazim <i>J. Kazim</i> Yoshitaka Imaeda <i>Y. Imaeda</i> Hiroyuki Oi <i>H.O.</i> Mamoru Sato <i>M. Sato</i>
Subjects	Training of analysis procedure Coliform, BTEX, CN and Oil and Grease

Details	Training of analysis procedure Coliform (Jamal) Test analysis GC (Qusai) Discussion of theory CN (Alam) Discussion about measurement procedure Oil and Grease (Alam) Discussion about solvent extraction procedure Attached document(s) Text of theory for GC
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Gas Chromatography

Chromatography is a group of analysis methods for separating very small quantities of complex mixtures with high resolution.

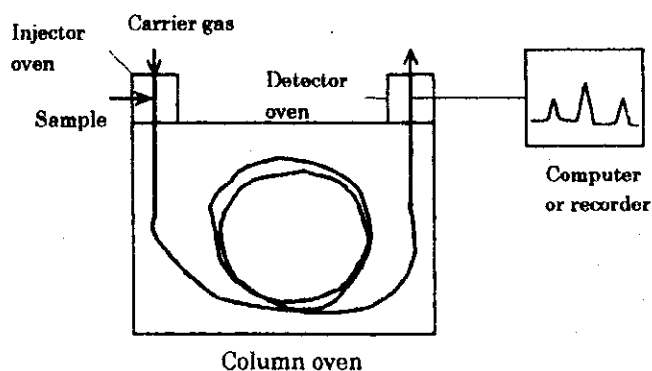
The basis of chromatography is the partition of the sample compounds between a stationary phase and a mobile phase which flows over or through the stationary phase.



A material in the mobile phase which has a stronger affinity for the stationary phase spends more time immobilized in that phase.

Gas chromatography employs an inert gas as the mobile phase and a solid absorbent or a non-volatile liquid coated on solid support as the stationary phase.

Separation depends on the relative partial pressures of the sample components above the stationary phase.



GC detector

After the components of mixture are separated in the chromatography column, they must be detected at the outlet so that they can be identified and measured.

FID (Flame ionization detector) is nearly universally sensitive to organic compounds and shows good sensitivity and linearity. The column effluent is fed into a flame fueled by hydrogen with a forced air flow. A potential of several hundred volts is imposed between the tip of flame burner and the collector. As the sample component burn, they produce a burst of ions. These produce a tiny current and measured by a electrometer.

Head space screening for VOCs

The head space analyzer is useful for VOC (volatile organic compound) measurement in water sample.

The sample is sealed into a septum-topped vial. The concentration of VOC in the head space gas is equilibrated by concentration in the liquid phase under certain temperature. The VOC concentration in the head space can be increased by raising temperature and by adding salt which helps to reduce the solubility of VOC in the water.

Internal Standard Method

An internal standard (IS) is known amount of a compound, different from analyte, that is added to the unknown. Signal from analyte is compared with signal from the IS to find out how much analyte is present.

IS is especially useful for analysis in which the quantity of the instrument response varies slightly from run to run for reasons that are difficult to control.

A calibration curve is only accurate for the one set of conditions under which it was obtained. However, the relative response of the detector to the analysis and standard is usually constant over a wide range of conditions.

IS is widely used in chromatography because the small quantity of sample injected into the chromatograph is not very reproducible in some experiments.

$$\frac{Ax}{X} = F \frac{As}{S}$$

where,

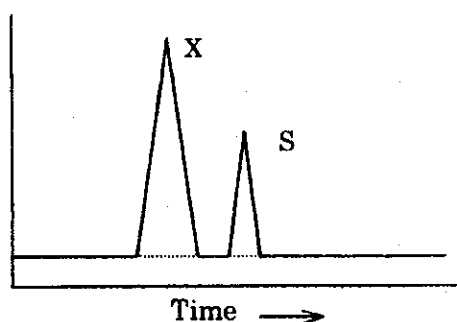
Ax: area of analyte signal

As: area of IS signal

X: concentration of sample

S: concentration of IS

F: response factor

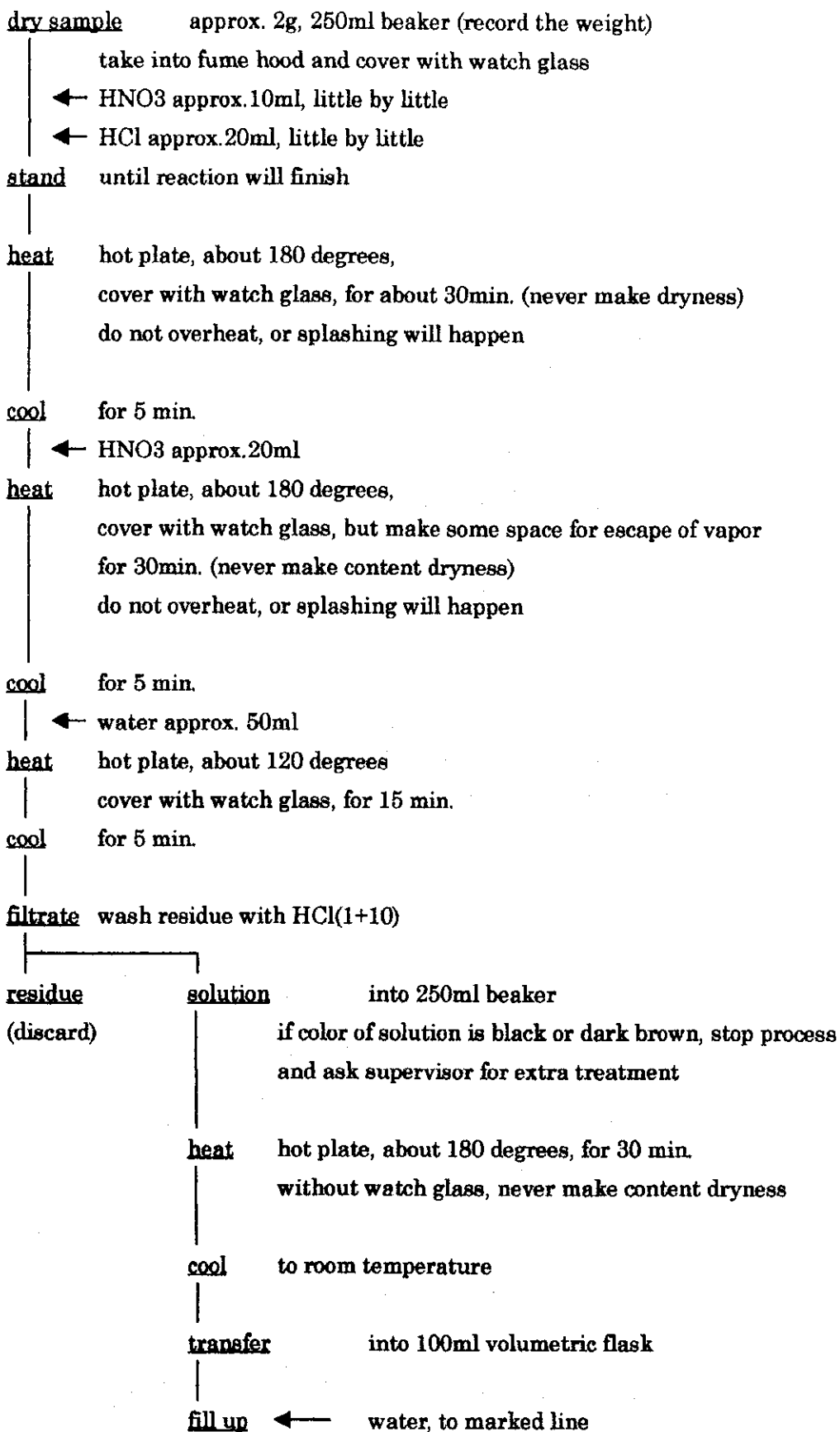


Daily report of Laboratory work

Date	28 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah Qusai M.</p> <p>Alam Nizami</p> <p>Jamal Kazim</p> <p>Yoshitaka Imaeda Y.I.</p> <p>Hiroyuki Oi H.O.</p> <p>Mamoru Sato M.S.</p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, BTEX, Metals and Oil and Grease</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Test analysis</p> <p>Explanation of result</p> <p>Metals (Jamal)</p> <p>Decomposition procedure (outline)</p> <p>Measurement procedure</p> <p>GC (Qusai)</p> <p>Operation</p> <p>Oil and Grease (Alam)</p> <p>Analysis of standard solution prepared in the laboratory</p> <p>Attached document(s)</p> <p>Analysis procedure (metals)</p>
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Metals in sediment (Cd, Pb, Cu, Zn, Co, Ni, Cr and V)



measure

AAS

AAS condition

N₂O-C₂H₂ flame: V, (Cr)

Air-C₂H₂ flame: others

Standard solutions

HCl 2ml / 100ml solution

(ppm)

elements	Cal 0	Cal 1	Cal 2
Cd	0	1	2
Ni	0	5	10
Cr	0	10	20
Co	0	5	10
V	0	50	100
Zn	0	0.5	1
Pb	0	10	20
Cu	0	5	10

Calculation

metal (ppm) = $a * 100 / V$

where;

a: metal concentration in measured solution (mg/L)

100: volume of measured solution (ml)

V; taken sample amount (g)

Daily report of Laboratory work

Date	29 May, 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>Am</i></p> <p>Jamal Kazim <i>J.K.</i></p> <p>Yoshitaka Imaeda <i>Y.I.</i></p> <p>Hiroyuki Oi <i>H.O.</i></p> <p>Mamoru Sato <i>M.S.</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, BTEX, Metals and Oil and Grease</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Counting</p> <p>Metals (Jamal)</p> <p>Decomposition procedure</p> <p>GC (Qusai)</p> <p>Preparation for standard solution</p> <p>Calibration</p> <p>Oil and Grease (Alam)</p> <p>Purification of used extraction solvent</p> <p>Attached document(s)</p>
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Daily report of Laboratory work

Date	30 May, 2000
Attendance	(initial of attendance) Hashim Al Zawad Qusai Bohlaiqah Alam Nizami Jamal Kazim Yoshitaka Imaeda Hiroyuki Oi Mamoru Sato
Subjects	Training of analysis procedure Coliform, NH3, TSS, Chlorophyll, Metals and Oil and Grease

Details	Training of analysis procedure Coliform (Jamal) Counting Measurement of seawater sample Metals (Jamal) Decomposition procedure Preparation of calibration solution TSS Preparation of analysis Chlorophyll Preparation of analysis Oil and Grease (Alam) Purification of used extraction solvent NH3 (Alam) Study on the measurement procedure Attached document(s)
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Daily report of Laboratory work

Date	31 May, 2000
Attendance	(initial of attendance) Hashim Al Zawad Qusai Bohlaiah <i>Qusai M.</i> Alam Nizami <i>Alam</i> Jamal Kazim <i>J.K.</i> Yoshitaka Imaeda <i>Y.I.</i> Hiroyuki Oi <i>H.O.</i> Mamoru Sato <i>M.S.</i>
Subjects	Training of analysis procedure Coliform, Metals, Chlorophyll, TPH and Oil and Grease

Details	<p>Training of analysis procedure</p> <p>Coliform (Janal)</p> <p>Measurement of seawater sample</p> <p>Metals (Jamal)</p> <p>Measurement with AAS</p> <p>Theory of measurement</p> <p>Explanation of "blank test" and contamination</p> <p>Chlorophyll (Qusai)</p> <p>Analysis operation</p> <p>Oil and Grease (Alam)</p> <p>Exercise of measurement using seawater</p> <p>TPH (Alam)</p> <p>Exercise of measurement using seawater</p> <p>Attached document(s)</p> <p>Analysis procedure (Chlorophyll)</p>
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Chlorophyll a – SM 10200 H**Spectrophotometric Method****[Apparatus]**

- Glass-fiber filter paper, 47 mm diam
- Filtrate system
- Centrifuge Tube with stopper (15 ml)
- Centrifuge
- Spectrophotometer

[Chemicals]

① Magnesium Carbonate solution

Dissolve 1.0 g MgCO_3 to 100 ml water

② Acetone solution (90 %) – prepare when it is needed

mix 90 ml acetone with 10 ml water

[Operation Flow]**Aliquot of Sample** put V ml of sample (about 1000 ml) into filtration funnel

with magnesium carbonate solution ① 1 ml

Filtrate

sample on filter may be placed in airtight plastic bag and stored frozen for 3 weeks

Filter into centrifuge tube

← acetone solution ② v ml (10–15 ml)

Stand in cool and dark place, 1 hour**Centrifuge** 3000 rpm, 10 min.**Pour** upper layer into test tube

Spectrophotometer with 10 mm cell at wavelength: 750, 664, 647 and 630 nm
 Contrast solution is Acetone solution ②

[Calculation]

$$\text{Chlorophyll a } (\mu\text{g/L}) = \{11.85 \cdot (\text{OD}_{664}) - 1.54 \cdot (\text{OD}_{647}) - 0.08 \cdot (\text{OD}_{630})\} \times v/V$$

OD₆₆₄, 647, 630: corrected optical densities (– OD₇₅₀)

v: volume of acetone solution (ml)

V: volume of sample (L)

Daily report of Laboratory work

Date	3 Jun., 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al Zawad</p> <p>Qusai Bohlaiah</p> <p>Alam Nizami</p> <p>Jamal Kazim</p> <p>Yoshitaka Imaeda</p> <p>Hiroyuki Oi</p> <p>Mamoru Sato</p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, Metals, LOI and TPH</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Janal)</p> <p>Counting</p> <p>Metals (Jamal)</p> <p>Decomposition procedure</p> <p>Loss of Ignition</p> <p>Preparation</p> <p>TPH (Alam)</p> <p>Exercise of measurement using sediment</p> <p>Attached document(s)</p>
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Daily report of Laboratory work

Date	4 Jun., 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>AN</i></p> <p>Jamal Kazim <i>JK</i></p> <p>Yoshitaka Imaeda <i>YI</i></p> <p>Hiroyuki Oi <i>H.O.</i></p> <p>Mamoru Sato <i>MS</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, Metals, TOC, CN, TSS and LOI</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Janal)</p> <p>Practice with seawater</p> <p>Metals (Jamal)</p> <p>Preparation</p> <p>TOC (Jamal)</p> <p>Measurement of seawater</p> <p>CN (Alam)</p> <p>Study on analysis</p> <p>TSS (Qusai)</p> <p>Measurement</p> <p>Loss of Ignition (Qusai)</p> <p>Measurement</p> <p>Attached document(s)</p>
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Daily report of Laboratory work

Date	10 Jun., 2000
Attendance	(initial of attendance) Hashim Al Zawad Quoni Bohlaiqah Alam Nizami Jamal Kazim Yoshitaka Imaeda Hiroyuki Oi Mamoru Sato
Subjects	Sample analysis Training of analysis procedure Coliform, TOC, Phenol and TKN

Details	Training of analysis procedure Coliform (Jamal) Discussion about sterilization procedure Blank test TOC in sediment Preparation of chemicals TOC in seawater Fundamentals Phenol (Alam) Calibration TKN Measurement Attached document(s) Materials used for explanation of TOC measurement
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TOC total organic carbon

· IC inorganic carbon

· OC organic carbon

· TC total carbon

$$\left(\begin{array}{l} TC = IC + OC \dots\dots\dots \\ \text{total} = \text{inorganic} + \text{organic} \end{array} \right)$$

measure

IC and TC

$$OC (=TOC) = TC - IC$$

if IC = 0

then

$$OC = TC - IC$$

$$= TC - \text{zero} = TC$$

$$\underline{OC = TC}$$

(organic compounds
contain C /

what is IC?

IC is CO_2 (gas)

(CO_3^{2-} (in liquid))

in seawater

IC is CO_3^{2-}

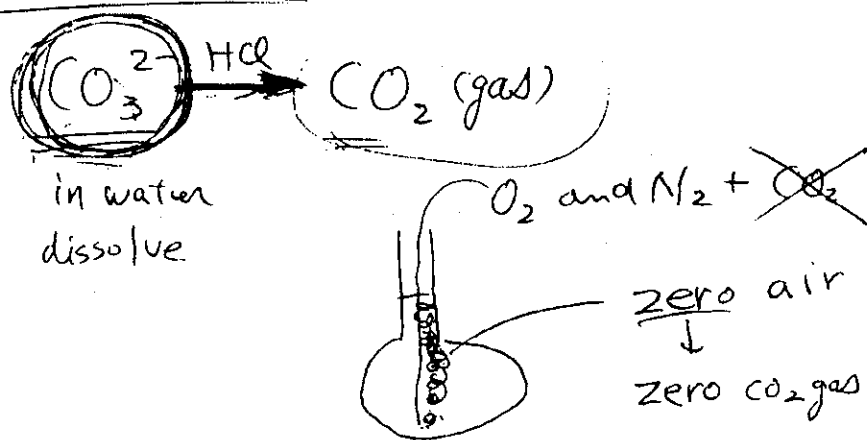
if we can remove CO_3^{2-} from seawater (sample)

$$\text{IC} = \text{O}$$



how to remove CO_3^{2-} in water?

add HCl, why?



{ add HCl
 bubbling } $\rightarrow \text{CO}_2 (\text{gas})$ ↑
 out of sample

$$\text{IC} = \text{O}$$

↓

$$\text{OC} (= \text{TOC}) = \text{TC}$$

organic total

Daily report of Laboratory work

Date	7 Jun., 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaigah</p> <p>Alam Nizami</p> <p>Jamal Kazim</p> <p>Yoshitaka Imaeda</p> <p>Hiroyuki Oi</p> <p>Mamoru Sato</p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, NH3 and TKN</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Counting</p> <p>NH3 (Alam)</p> <p>Distillation</p> <p>TKN</p> <p>Measurement</p> <p>Preparation of sample bottle</p> <p>Attached document(s)</p>
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Daily report of Laboratory work

Date	6 Jun., 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al-Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>AN</i></p> <p>Jamal Kazim <i>JK</i></p> <p>Yoshitaka Imaeda <i>Y.I</i></p> <p>Hiroyuki Oi <i>HO</i></p> <p>Mamoru Sato <i>MS</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Coliform, Metals, CN and TKN</p>

Details	<p>Training of analysis procedure</p> <p>Coliform (Jamal)</p> <p>Test of sterilization</p> <p>Metals (Jamal)</p> <p>Measurement</p> <p>Explanation of field note</p> <p>Calculation</p> <p>CN (Alam)</p> <p>Distillation and measurement</p> <p>TKN (Qusai)</p> <p>Measurement</p> <p>Explanation of sampling schedule</p> <p>Attached document(s)</p> <p>Schedule of sampling</p> <p>Field note for metal analysis</p>
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Schedule of Sampling

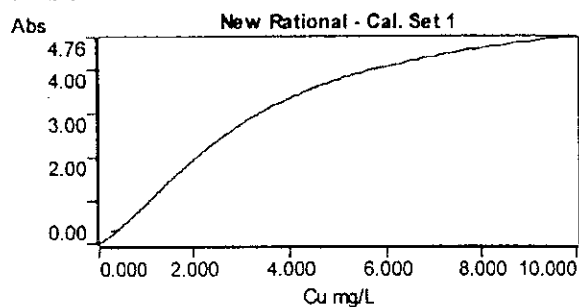
Date	Sample ID	Water Sample																	Sediment Sample									
		Plastic Bottle												Glass Bottle					whirl-pak	whirl-pak							Glass Bottle	
		500ml					1 L			2 L				250ml	500ml	1 L		125ml	350ml							500ml		
		HNO ₃ (1+1) 5 ml 2 bottles					NaOH 6 - 7 pellets			H ₂ SO ₄ (1+3) 15 ml				HCl (1+1) 2 ml	H ₂ SO ₄ (1+3) 8 ml	HCl (1+1) 4 ml	HCl (1+1) 4 ml	(sterile)								(wide mouth)		
		Metals	As	Cr	Hg	Mg	CN	TSS TDS	chloro- phyll	TOC	TKN	T-P	NH ₃	BTEX	Phenol	Oil & Grease	TPH	coliform	Ignite Loss	TOC	Metals	As	Cr	Hg	V	TPH	BTEX	
10-Jun	H40						o																					
	H50	o					o		o						o					o						(o)	(o)	
11-Jun	H1						o	o		o	o								o									
	H2							o																				
12-Jun	K7	o				o													o	o	o	o	o					
	K8	o	o	o		o													o	o	o	o	o					
13-Jun	K4						o		o	o	o	o			o		o	o	o	o	o	o						
	K5	o	o	o			o		o	o	o	o			o		o	o	o	o	o	o			o			
	K6					o	o		o	o	o						o	o	o	o	o	o						
14-Jun	K1						o	o		o	o							o	o	o	o	o						
	K2	o	o	o	o	o	o		o	o	o	o			o		o	o	o	o	o	o	o	o				
	K3						o	o	o	o	o							o	o	o	o							
17-Jun	T110	o	o	o	o			o		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	
18-Jun	T6	o	o	o	o	o		o	o	o	o	o	o					o		o	o	o				o		
	T7							o	o	o	o	o	o					o										
	T120	o	o	o	o	o		o	o	o	o	o	o					o										
19-Jun	T2							o	o	o	o	o	o					o	o	o	o							
	T3							o	o		o	o	o					o										
	T4							o		o	o	o	o					o	o	o	o					o		
20-Jun	R1															o	o		o	o	o				o	o	o	
	R2																			o	o	o			o	o	o	
	R40	o						o						o	o		o				o	o	o	o	o	o	o	
24-Jun	J1	o	o	o	o	o	o	o	o	o	o	o						o	o	o	o	o	o	o	o	o	o	
	J2																											
	J4							o	o		o	o									o	o	o	o	o	o	o	
25-Jun	J5	o	o	o	o	o	o	o		o	o	o	o		o	o			o	o	o	o	o	o	o	o	o	
	J6	o	o	o	o		o	o		o	o	o									o	o	o	o	o	o	o	
	J7								o		o	o																
26-Jun	J80							o								o	o				o		o			o	o	
	J90									o																		
27-Jun	DD20										o	o							o	o	o	o	o	o	o	o	o	

Analyst
Date Started 10:11 AM 6/6/00
Worksheet 6-6test
Comment Sato
Methods Cd,Pb,Zn,Cu,Co,Ni

Nominal Weight = 1.0000 Nominal Volume = 100.00

Method: Cu (Flame)

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings		
CAL ZERO	0.000	26.2	-0.0012	1.0000	100.00	-0.0008	-0.0015	-0.0012
STANDARD 1	5.000	0.6	3.7590	1.0000	100.00	3.7617	3.7808	3.7343
STANDARD 2	10.000	0.2	4.7525	1.0000	100.00	4.7615	4.7434	4.7527



Curve Fit = New Rational

Characteristic Conc = 0.006 mg/L

r = 1.0000

Calculated Conc = -0.002 5.000

Residuals = 0.002 0.000

Sample 001	0.342	1.1	0.2761	1.0000	100.00	0.2754	0.2736	0.2794
Sample 002	0.267	0.6	0.2123	1.0000	100.00	0.2128	0.2133	0.2108
Sample 003	0.237	0.4	0.1872	1.0000	100.00	0.1876	0.1864	0.1876
Sample 004	0.010	9.7	0.0074	1.0000	100.00	0.0081	0.0067	0.0073
Sample 005	4.874	0.3	3.7130	1.0000	100.00	3.7237	3.7157	3.6998

Chemical analysis field note (AAS)

Cu

date dd/mm/yy 3-6-2000	Name JAMAL KAZIM	
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#	Sample name	Sample Amount (g)	Concentration in solution (mg/L-ppm)	Final volume (ml)	-B.T.		PPM	Concentration in sample (ppm)
1	R ₁	2.0506	0.342	100	0.332		16.19	16
2	J ₁	2.2986	0.267	100	0.257		11.18	11
3	J ₁	2.0042	0.237	100	0.227		11.32	
4	Blank test	0	0.010	100	—			
5			4.874					

Conc. of std. sol'n. (mg/L)	Absorbance (Abs.)	
5.0	3.75	
10.0	4.75	

$$\text{metal (ppm)} = \frac{\text{Sample} - \text{B.T.} \times \text{Sample weight (g)}}{\text{Sample weight (g)}}$$

Chemical analysis field note (AAS)

Zn

date dd/mm/yy 3-6-2000	Name JAMAL KAZIM	
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#	Sample name	Sample Amount (g)	Concentration in solution (mg/l = ppm)	Final volume (ml)	- B.T.		ppm	Concentration in sample (ppm)
1	R1	2.0506	over	100				
2	J1	2.2986	0.3132	100	0.2506		10.9 0.109	
3	J1	2.0042	0.2818	100	0.2820		14.0	12
4	Blank Test	0	0.0312	100	—			
5	cal. 1 (STD)		0.5262					

12.45

	Conc. of std. sol'n. (mg/l)	Absorbance (Abs.)	
1	0.5	2.01	
2	1.0	2.96	

$$\text{Metal (ppm)} = \frac{\text{Sample - B.T. (mg/l)}}{\text{Sample weight (g)}} \times 100$$

Chemical analysis field note (AAS)

Cd

date
dd/mm/yy 3-6-2000Name
JAMAL KAZIM

#	Sample name	Sample Amount (g)	Concentration in solution (mg/L=ppm)	Final volume (ml)	-B.T.		PPM	Concentration in sample (ppm)
1	R1	2.0506	0.047	100	0.041		1.99	2
2	J1	2.2986	0.045	100	0.039		1.69	2
3	J1	2.0042	0.040	100	0.034		1.69	
4	Blank Test	0	0.006	100	—			
5			0.941					

Conc. of std. sol'n. (mg/L)	Absorbance (Abs.)	
1	3.52	
2	5.10	

$$\text{metal (ppm)} = \frac{\text{Sample - B.T.}}{\text{Sample weight (g)}}$$

Daily report of Laboratory work

Date	5 Jun., 2000
Attendance	<p>(initial of attendance)</p> <p>Hashim Al Zawad</p> <p>Qusai Bohlaiah <i>Qusai M.</i></p> <p>Alam Nizami <i>AN</i></p> <p>Jamal Kazim <i>JK</i></p> <p>Yoshitaka Imaeda <i>Y.I.</i></p> <p>Hiroyuki Oi <i>H.O.</i></p> <p>Mamoru Sato <i>MS</i></p>
Subjects	<p>Training of analysis procedure</p> <p>Metals, Coliform, CN, BTEX and LOI</p>

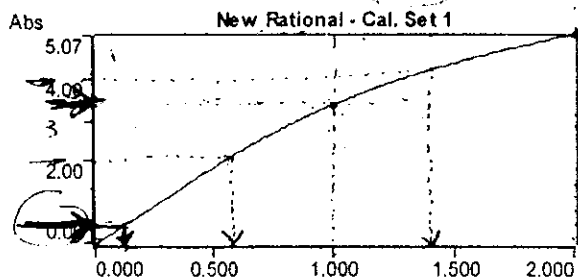
Details	<p>Training of analysis procedure</p> <p>Metals (Jamal)</p> <p>Measurement</p> <p>Explanation of result</p> <p>Coliform (Jamal)</p> <p>Practice</p> <p>CN (Alam)</p> <p>Preparation of reagents</p> <p>BTEX in sediment (Qusai)</p> <p>Measurement</p> <p>Loss of Ignition (Qusai)</p> <p>Measurement</p> <p>Attached document(s)</p> <p><i>materials for explanation of metal measurement</i></p>
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Analyst
 Date Started 11:53 AM 5/31/00
 Worksheet may 31test
 Comment Sato
 Methods Cd,Pb,Zn,Cu,Co,Ni

Nominal Weight = 1.0000

Nominal Volume = 100.00

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings
CAL ZERO	0.000	15.9	-0.0142	1.0000	100.00	-0.0149 -0.0117 -0.0160
STANDARD 1	1.000	0.9	3.3576	1.0000	100.00	3.3881 3.3531 3.3315
STANDARD 2	2.000	0.7	5.0713	1.0000	100.00	5.0361 5.0666 5.1114

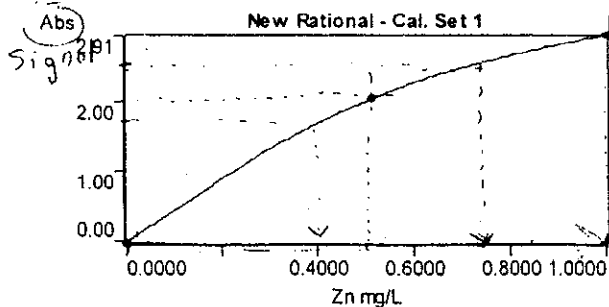


Curve Fit = New Rational
 Characteristic Conc = 0.001 mg/L
 r = 1.0000
 Calculated Conc = -0.004 1.000 2.000
 Residuals = 0.004 0.000 0.000

Sample 001	0.024	2.3	0.0820	1.0000	100.00	0.0840 0.0802 0.0819
Sample 002	0.023	4.6	0.0787	1.0000	100.00	0.0745 0.0813 0.0802
Sample 003	0.047	2.2	0.1600	1.0000	100.00	0.1616 0.1623 0.1560
Sample 004	0.012	1.1	0.0394	1.0000	100.00	0.0399 0.0392 0.0390
Sample 005	0.980	0.8	3.3051	1.0000	100.00	3.3344 3.2942 3.2868

Method: Zn (Flame)

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings
CAL ZERO	0.0000	>100	-0.0006	1.0000	100.00	0.0007 -0.0009 -0.0016
STANDARD 1	0.5000	0.5	1.9920	1.0000	100.00	1.9939 1.9819 2.0001
STANDARD 2	1.0000	0.2	2.9141	1.0000	100.00	2.9109 2.9204 2.9111



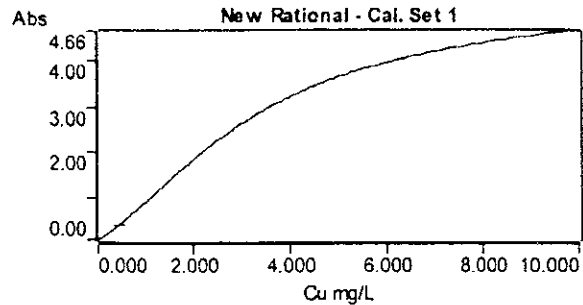
Curve Fit = New Rational
 Characteristic Conc = 0.0011 mg/L
 r = 1.0000
 Calculated Conc = -0.0001 0.5000 1.0000
 Residuals = 0.0001 0.0000 0.0000

Sample 001	0.8803	0.4	2.7619	1.0000	100.00	2.7567 2.7551 2.7739
Sample 002	0.4430	0.3	1.8202	1.0000	100.00	1.8185 1.8165 1.8256

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings		
Sample 003	0.1037	0.8	0.4413	1.0000	100.00	0.4439	0.4374	0.4426
Sample 004	0.4276	1.0	1.7702	1.0000	100.00	1.7681	1.7530	1.7896
Sample 005	0.4849	0.2	1.9483	1.0000	100.00	1.9519	1.9460	1.9468

Method: Cu (Flame)

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings		
CAL ZERO	0.000	33.4	-0.0006	1.0000	100.00	-0.0008	-0.0007	-0.0004
STANDARD 1	5.000	0.2	3.6337	1.0000	100.00	3.6323	3.6433	3.6257
STANDARD 2	10.000	0.2	4.6571	1.0000	100.00	4.6644	4.6492	4.6578



Curve Fit = New Rational

Characteristic Conc = 0.006 mg/L

r = 1.0000

Calculated Conc = -0.001 5.000

Residuals = 0.001 0.000

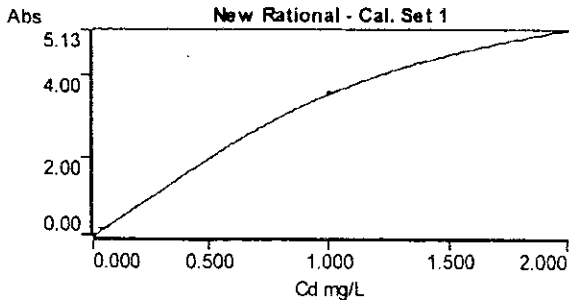
Sample 001	0.431	0.6	0.3394	1.0000	100.00	0.3373	0.3398	0.3411
Sample 002	0.135	0.6	0.1004	1.0000	100.00	0.0998	0.1003	0.1010
Sample 003	0.141	1.2	0.1056	1.0000	100.00	0.1068	0.1043	0.1056
Sample 004	0.457	1.2	0.3620	1.0000	100.00	0.3641	0.3650	0.3569
Sample 005	4.880	0.3	3.5892	1.0000	100.00	3.5849	3.6024	3.5803

Analyst
Date Started 10:26 AM 6/5/00
Worksheet 5-6test
Comment Sato
Methods Cd,Pb,Zn,Cu,Co,Ni

Nominal Weight = 1.0000 Nominal Volume = 100.00

Method: Cd (Flame)

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings		
CAL ZERO	0.000	8.9	-0.0163	1.0000	100.00	-0.0147	-0.0175	-0.0169
STANDARD 1	1.000	0.4	3.5290	1.0000	100.00	3.5395	3.5367	3.5108
STANDARD 2	2.000	0.8	5.1056	1.0000	100.00	5.1260	5.1300	5.0609

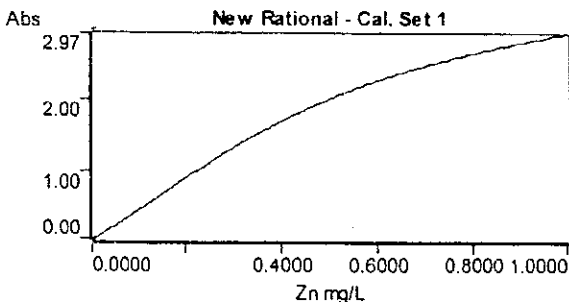


Curve Fit = New Rational
 Characteristic Conc = 0.001 mg/L
 r = 1.0000
 Calculated Conc = -0.005 1.000
 Residuals = 0.005 0.000

Sample 001	0.047	1.5	0.1675	1.0000	100.00	0.1704	0.1662	0.1659
Sample 002	0.045	0.5	0.1608	1.0000	100.00	0.1609	0.1599	0.1616
Sample 003	0.040	0.8	0.1439	1.0000	100.00	0.1449	0.1428	0.1441
Sample 004	0.006	14.7	0.0223	1.0000	100.00	0.0249	0.0235	0.0186
Sample 005	0.941	0.7	3.3774	1.0000	100.00	3.3515	3.3811	3.3937

Method: Zn (Flame)

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings		
CAL ZERO	0.0000	44.2	0.0020	1.0000	100.00	0.0015	0.0014	0.0030
STANDARD 1	0.5000	0.7	2.0100	1.0000	100.00	2.0043	1.9992	2.0265
STANDARD 2	1.0000	0.4	2.9626	1.0000	100.00	2.9748	2.9645	2.9484



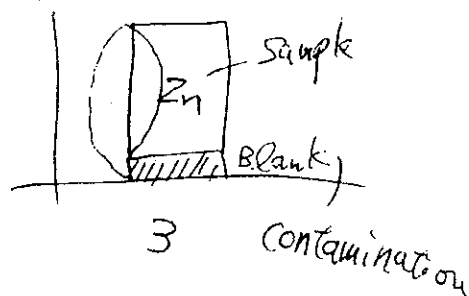
Curve Fit = New Rational
 Characteristic Conc = 0.0011 mg/L
 r = 1.0000
 Calculated Conc = 0.0005 0.5000
 Residuals = -0.0005 0.0000
 W0545: Sample result OVER the calibration range

Sample ID	Conc mg/L	%RSD	Mean Abs	Weight	Volume	Readings		
Sample 001	OVER	0.0	3.5305	1.0000	100.00	3.5305		
Sample 002	0.3132	1.4	1.3627	1.0000	100.00	1.3408	1.3734	1.3739
Sample 003	0.2818	0.6	1.2340	1.0000	100.00	1.2341	1.2270	1.2410
Sample 004	0.0312	1.2	0.1283	1.0000	100.00	0.1265	0.1287	0.1297
Sample 005	0.5262	0.6	2.0847	1.0000	100.00	2.0706	2.0946	2.0888

Sample 3:

0.2818 mg/l
 B.T. 0.0312 mg/l

0.2506 mg/l



Sample 2

0.3132

B.T. 0.0312

0.2820

Chemical analysis field note (AAS)

Zn

date dd/mm/yy 3-6-2000	Name JAMAL KAZIM
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#	Sample name	Sample Amount (g)	Concentration in solution (mg/L = ppm)	Final volume (ml)	- B.T.		ppm	Concentration in sample (ppm)
1	R1	2.0506	over	100				
2	J1	2.2986	0.3132	100	0.2506			
3	J1	2.0042	0.2818	100	0.2820			
4	Blank Test	0	0.0312	100	—			
5	cal. 1 (STD)		0.5262					

	Conc. of std. sol'n. (mg/L)	Absorbance (Abs.)	
1	0.5	0.201	
2	1.0	2.96	

$$\text{Metal (ppm)} = \frac{\text{Sample - B.T. (mg/L)}}{\text{Sample weight (g)}}$$

4.7/0.38

Corrected

10

11 June 2000 Qusai M.

$B/C = 0.004$
 $TKN = 0.020$
 $NH_3 = 0.018$

Date	Name
13 June	Qusai M.

A - 110

Data Sheet of Chlorophyll a

No. 1

Filtration

Measurement

No.	sample		Note		wave length of spectrophotometer				calculated value (µg/L)	Note
	I.D.	volume (L)			750 nm	664 nm	647 nm	630 nm		
					a	b	c	d	C	
				contrast (blank)	0.000	0.605	0.606	0.607		
6/12	1	H1	1.00		absorbance 0.000	0.615	0.609	0.609		
				- blank	0.000	0.010	0.003	0.002	1.14	
	2	T6	0.99	Drain Yellow color	absorbance 0.270	0.943	0.743	0.702		
				- blank	0.270	0.338	0.137	0.002	10.42	
	3	T7	1.00		absorbance 0.005	0.718	0.641	0.634		
				- blank	0.005	0.113	0.035	0.027	12.32	
	4	T120	1.00		absorbance 0.001	0.613	0.608	0.608		
				- blank	0.001	0.008	0.002	0.001	0.81	
6/14	5	K1	1.00		absorbance 0.000	0.605	0.607	0.604		
				- blank	0.000	0.000	0.001	0.000	0.02	tx < 0.1
	6	K3	0.99		absorbance 0.000	0.608	0.606	0.607		
				- blank	0.000	0.003	0.002	0.003	0.32	

7 H2 1.00

$$C = \frac{1000}{2.303} \left\{ 1.85(b-a) - 1.54(c-a) - 0.08(d-a) \right\} \times 10/V$$

Date	Name
12 June	Olvi

Date	Name
19 June	Surai M.

添付資料 D

衛星画像解析に係る 技術移転関連資料

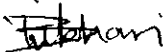

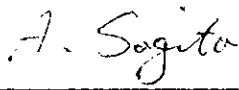
Daily Report of Satellite Data Analysis

Daily report of Satellite Data Analysis

Date	20 Jun, 2000
Attendance	<div> <div>(initial of attendance)</div> <div> Mohammed A. Bukhari <div><i>M. Bukhari</i></div> </div> </div> <div> Krishna Kumar Mishra <div><i>K. Mishra</i></div> </div> <div> Akihiro Sugita <div><i>A. Sugita</i></div> </div>
Subject	Satellite Data Processing Work

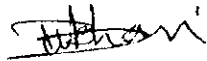


Deatails	<p>Explanation of the Satellite Data brought from Japan</p> <p>Initial discussions about processing the data</p>
----------	--

Daily report of Satellite Data Analysis

Date	21 Jun, 2000	
Attendance	Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita	(initial of attendance)   
Subject	Satellite Data Processing Work	




Deatails	Arrangement & Installation of the Data Processing Units
----------	---

Daily report of Satellite Data Analysis

Date	24 Jun, 2000
Attendance	<div>(initial of attendance)</div> <div>Mohammed A. Bukhari </div> <div>Krishna Kumar Mishra </div> <div>Akihiro Sugita </div>
Subject	Satellite Data Processing Work

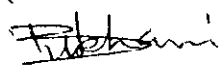
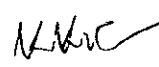

Deatails	<p>Data Transferring to the UNIX WORKSTATION</p> <p>TM data brought from Japan were installed to the computer hard disk</p>
----------	---

Daily report of Satellite Data Analysis

Date	25 Jun, 2000	
Attendance	Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita	(initial of attendance)   
Subject	Satellite Data Processing Work	

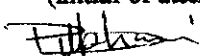
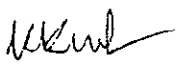
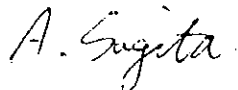
Deatails	Satellite Data Processing Required TM data were subset from the loaded data Data display procedures and understanding of image viewing properties (image contrast adjustment, histogram manipulation etc.)
----------	--

Daily report of Satellite Data Analysis

Date	26 Jun, 2000
Attendance	<div> <div> Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita </div> <div> <div>(initial of attendance)</div>    </div> </div>
Subject	Satellite Data Processing Work

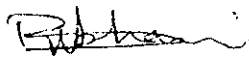

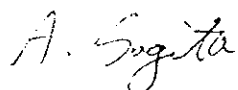
Deatails	Satellite Data Processing Geo-referencing of the original TM data
----------	--

Daily report of Satellite Data Analysis

Date	27 Jun, 2000
Attendance	<div> <div> Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita </div> <div> <div>(initial of attendance)</div>    </div> </div>
Subject	Satellite Data Processing Work



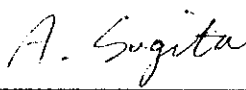
Deatails	Satellite Data Processing Geo-referencing of the original TM data
----------	--

Daily report of Satellite Data Analysis

Date	28 Jun, 2000
Attendance	<div> <div> Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita </div> <div> <div>(initial of attendance)</div>    </div> </div>
Subject	Satellite Data Processing Work

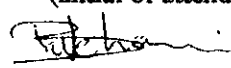

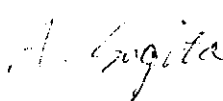
Deatails	<p>Satellite Data Processing</p> <p>Processing for temperature distribution</p> <p>Utilization of TM Band 6</p> <p>Selection of temperture range over water surface</p> <p>Deciding the TM digital numbers (DNs) in accordance to temperature distribution chart</p>
----------	--

Daily report of Satellite Data Analysis

Date	1 July, 2000
Attendance	<div> <div> Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita </div> <div> <div>(initial of attendance)</div>    </div> </div>
Subject	Satellite Data Processing Work



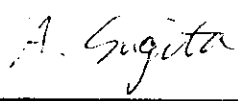
Deatails	<p>Satellite Data Processing</p> <p>Processing for temperature distribution</p> <p>Performing the correlation analysis</p> <p>Preparation of the final classes for the distribution</p> <p>Image mosaic of the analyzed images</p>
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Daily report of Satellite Data Analysis

Date	2 July, 2000
Attendance	<div>(initial of attendance)</div> <div> Mohammed A. Bukhari  </div> <div> Krishna Kumar Mishra  </div> <div> Akihiro Sugita  </div>
Subject	Satellite Data Processing Work

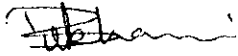

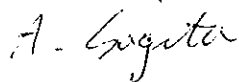
Deatails	Satellite Data Processing Creation of the map by Map Composer for printing the output map of the distribution Conversion to Tiff file for printing
----------	---

Daily report of Satellite Data Analysis

Date	3 July, 2000
Attendance	<div style="text-align: right;">(initial of attendance)</div> <div style="display: flex; justify-content: space-between;"> <div> Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita </div> <div>    </div> </div>
Subject	Satellite Data Processing Work

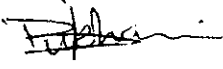
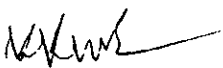
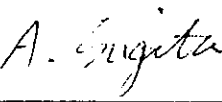
Deatails	Satellite Data Processing Processing for suspended solids distribution Utilization of TM bands 1,2,3,4 for Spectral Enhancement by Principal Component Analysis (PCI) Hard disk adjustment for huge file generation as temporary files before completion of the analysis
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Daily report of Satellite Data Analysis



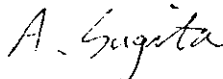
Date	4 July, 2000
Attendance	<div>(initial of attendance)</div> <div> Mohammed A. Bukhari  </div> <div> Krishna Kumar Mishra  </div> <div> Akihiro Sugita  </div>
Subject	Satellite Data Processing Work

Deatails	Satellite Data Processing Continuation of the PCI analysis and adjustment of available disk space
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Daily report of Satellite Data Analysis



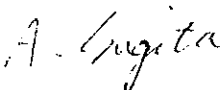
Date	5 July, 2000
Attendance	<p>(initial of attendance)</p> <p>Mohammed A. Bukhari </p> <p>Krishna Kumar Mishra </p> <p>Akihiro Sugita </p>
Subject	Satellite Data Processing Work
Deatails	<p>Satellite Data Processing</p> <p>Utilization of TM band 3 for the suspended solids analysis as PCI analysis resulted technical troubles</p> <p>Slicing on TM 3</p> <p>DNs selection for correlation analysis</p>

Daily report of Satellite Data Analysis

Date	8 July, 2000
Attendance	<div> <div> Mohammed A. Bukhari Krishna Kumar Mishra Akihiro Sugita </div> <div> <div>(initial of attendance)</div>    </div> </div>
Subject	Satellite Data Processing Work

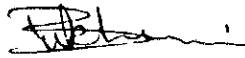
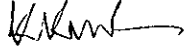
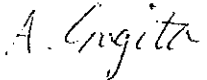
Deatails	Satellite Data Processing Finalization of the categories for the distribution Preparation of the mosaic images Creation of the map composer Coverion to Tiff file for printing
----------	--

Daily report of Satellite Data Analysis

Date	9 July, 2000
Attendance	<div>(initial of attendance)</div> <div> Mohammed A. Bukhari  </div> <div> Krishna Kumar Mishra  </div> <div> Akihiro Sugita  </div>
Subject	Satellite Data Processing Work

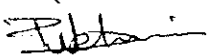

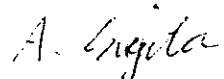
Deatails	Satellite Data Processing Chlorophyll distribution analysis Selection of TM band 4 Slicing the image DNs selection Classes selection for the distribution
----------	--

Daily report of Satellite Data Analysis

Date	10 July, 2000
Attendance	<div>(initial of attendance)</div> <div> Mohammed A. Bukhari  </div> <div> Krishna Kumar Mishra  </div> <div> Akihiro Sugita  </div>
Subject	Satellite Data Processing Work



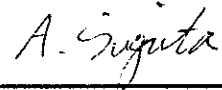
Deatails	Satellite Data Processing Classes selection for the distribution Correlation analysis Recoding of the prepared image Mosaic images
----------	--

Daily report of Satellite Data Analysis

Date	11 July, 2000
Attendance	<div>(initial of attendance)</div> <div> Mohammed A. Bukhari  </div> <div> Krishna Kumar Mishra  </div> <div> Akihiro Sugita  </div>
Subject	Satellite Data Processing Work

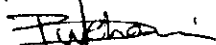

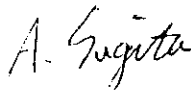
Deatails	Satellite Data Processing Map composer preparation Conversion of the image data to TIFF form Print the color hard copies
----------	---

Daily report of Satellite Data Analysis

Date	12 July, 2000
Attendance	<div>(initial of attendance)</div> <div> Mohammed A. Bukhari  </div> <div> Krishna Kumar Mishra  </div> <div> Akihiro Sugita  </div>
Subject	Satellite Data Processing Work

Deatails	Satellite Data Processing Classification of the data Unsupervised classification Recoding of the data Mosaicing Map composer Hard copy printing
----------	---

Daily report of Satellite Data Analysis

Date	13 July, 2000
Attendance	<div> <div> Mohammed A. Bukhari </div> <div> (initial of attendance)  </div> </div> <div> <div> Krishna Kumar Mishra </div> <div>  </div> </div> <div> <div> Akihiro Sugita </div> <div>  </div> </div>
Subject	Satellite Data Processing Work

Deatails	Satellite Data Processing Final reviewing of the whole processing
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添付資料 E

第1回ワークショップ 関連資料

Workshop Program

List of Participants

Resume of Presentation

Q & A Summary

KINGDOM OF SAUDI ARABIA

Ministry of Defence & Aviation
Meteorology & Environmental
Protection Administration (MEPA)
Eastern Province



المملكة العربية السعودية
وزارة الدفاع والطيران
مصلحة الارصاد وحماية البيئة
المنطقة الشرقية

الرقم:

التاريخ:

المرفقات:

WORKSHOP PROGRAM

Introduction:

Reference to the agreement between JICA (Japan International Cooperation Agency) and MEPA (Meteorology & Environmental Protection Administration) one day workshop program will be held on at Dammam MEPA office dated 07 July 1999. The title of this workshop is "Environmental Assessment and Water Quality Monitoring Program in the Arabian Gulf".

Program

1. **Location:** Office of MEPA Eastern Province
Post Box # 117, Dhahran - 31932
Phone # 03-857-6260, Fax # 03-857-6752
2. **Date/Time:** July 07, 1999 / 08:30 AM
3. **Chairman:** Dr. Abdul Rahman Al-Arfaj from 8:30AM - 10:30 AM
Mr. Aziz Al-Omari from 10:50 AM - 12:00 noon
4. **Schedule:**
08:30 - 08:40 Mr. Hamdan Al -Ghamdi, Welcome speech
08:40 - 08:50 Mr. Yasuhiro Shimazu, Introduction of the work
08:50 - 09:20 Mr. Aziz Al-Omari, Mepa rule & the management of the project
09:20 - 09:30 Question & Answer
09:30 - 09:50 Dr. Robert Hilliard, Deign of water monitoring
09:50 - 10:00 Discussion
10:00 - 10:15 Mr. kazutake Tanaka, Socio- economical frame work of the project
10:15 - 10:30 Mr. Khaled Al-Rasheed, Cooperation, coordinate with coast guard
10:30 - 10:50 Coffee Break
10:50 - 11:40 Discussion
11:40 - 11:50 Conclusion & summery by the chairman
11:50 - 12:00 Closing speech by Mr. Hamdan
5. 12:00- 12:30 **Pray time**
6. 12:30 - **Buffet Party.**
All workshop participants are invited for buffet party.

**“An Environmental Assessment and Water Quality Monitoring
of Arabian Gulf in the Kingdom of Saudi Arabia”**

WORKSHOP PROGRAM

Date : 07 July 1999
At 08:00 AM
Dammam MEPA office
Eastern Region

The Workshop Participant name and address are under listed below.

1. Name : Dr. Akhtar H. Khan Company/Agency Name : National Environmental Presentation Co. Rank/Position : Laboratory Manager Address : Post Box # 10628, Jubail - 31961 Tel. # 03 - 358-8008, Ext. # 38 Fax # 03 - 358-8584
2. Name : Mr. Joe A. Company/Agency Name : Saudi Gazette Rank/Position : Bureau Chief Address : Post Box # 2230, Dammam Tel. # 859-4003
3. Name : Dr. Ali Al - Dakhil - Allah Company/Agency Name : KFUPM Rank/Position : Assistant Professor Address : Post Box # 646, Dhahran - 31261. Tel # 8603232
4. Name : Dr. Nabil S. Abuzaid Company/Agency Name : KFUPM Rank/Position : Research Engineer Address : Post Box # 951, Dhahran - 31261 Tel. # 03-860-4944 Fax # 03-860-3220
5. Name : Dr. Ghasham I. Al-ghasham Company/Agency Name : Al-Jubail Municipality Rank/Position : Address : Al-Jubail Municipality Tel./Fax # : 03-3623259
6. Name : Khalifa Abdullah Al-Saad Company/Agency Name : Dammam, Municipality Rank/Position : Address : Dammam, Municipality Tel./Fax # 8270131

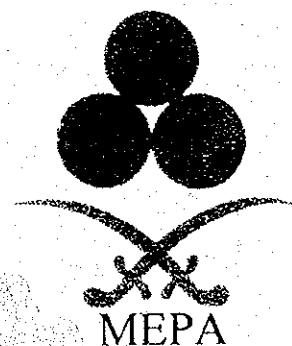
<p>7. Name : Mr. Zaki Alawi Alawami Company/Agency Name : Dammam, Municipality Rank/Position : Address : Dammam, Municipality Tel./Fax # 8331686</p>
<p>8. Name : Mr. Tawfiq Abdullah Al-Ghenjafi Company/Agency Name : Water and Sewerage Authority Rank/Position : Operation and Maintenance Address : Qatif Tel./Fax # 8558700</p>
<p>9. Name : Al- Mahel Ali Company/Agency Name : Water and Sewerage Authority Rank/Position : Operation and Maintenance Address : Qatif Tel./Fax # 8558700</p>
<p>10. Name : Mohammed Arif Ali Company/Agency Name : SABCO Rank/Position : Engr. Address : Dammam Tel./Fax # 8575784</p>
<p>11. Name : Mr. Raed F. Al Dulaijan Company/Agency Name : Sceco Qurrayah Power Plant. Rank/Position : Supt., Maint. Operation Address : Sceco East. Post Box # 5190, Dammam-31422. Tel. # 8582178/ 8582171 Fax # 8580401</p>
<p>12. Name : Mr. Ibrahim Al Wayel Company/Agency Name : Water Authority Rank/Position : Sanitary Division Address : Post Box # 4650, Dammam- 31198 Tel. # 827222 Ext. 318</p>
<p>13. Name : Mr. Saleh M. Al Hujala Company/Agency Name : C.G. Rank/Position : Major Address : Rastanourah - C.G. Tel./Fax # 6789910</p>
<p>14. Name : Mr. Hussain A. Al-Hajari Company/Agency Name : SAFCO Rank/Position : Senior Progress Engineer Address : Post Box # 553, Dammam-31421. Tel. # 8575011 Ext. 5075 Fax # 8572601</p>
<p>15. Name : Mr. Farrag Khazim Al-Shahri Company/Agency Name : Civil Defense Rank/Position : IOT, Con. Address : Tel. # 0555900176</p>

16. Name : Al Jaber Abdel Rahman Company/Agency Name : King Faisal University Rank/Position : Lecturer Address : KFU, Post Box # 420, Hofuf-31982 Tel. # 5800000 Ext. 1412.
17. Name : Mohammed Hassan Al-Malekh Company/Agency Name : KFUPM Rank/Position : Assistant Professor Address : Post Box # 1150, Dhahran - 31261 Tel. # 8604735
18. Name : Mohammed Al-Owafeir Al-Ghenjafi Company/Agency Name : King Faisal University Rank/Position : Assistant Professor (Staff) Address : KFU, Post # 420, Hofuf Tel. # 580000 Ext. 1401/1864
19. Name : Mr. Farid Zaki Farid Company/Agency Name : SCECO Rank/Position : Plant Engineer Address : Post Box # 5190, Dammam-31422. Tel. # 858-2119 Fax # 858-0401
20. Name : Mohammed Masooduddin Company/Agency Name : Royal Commission Rank/Position : Env. Control Specialist Address : Post Box # 10001, Royal commission Jubail - 31961 Tel. # 3413093
21. Name : Mr. Iyad Shanaa Company/Agency Name : RGME/RC Rank/Position : Program Manager Address : Post Box # 10476, Jubail Ind, City-31981 Tel. # 03-341-1749 Fax # 03-341-0120
22. Name : Mr. Tawfiq S. Al-Issa Company/Agency Name : SAFCO Rank/Position : Safety Inspector Address : Post Box # 355, Dammam-31421. Tel. # 8575011
23. Name : Mr. Abdul Aziz H.M. Al-Thebiani Company/Agency Name : Royal Commission Rank/Position : Env. Control Sp. Address : Jubail Industrial City Tel. # 3413092
24. Name : A.H. Al Mahasnah Company/Agency Name : SCECO East. Rank/Position : Supt. TSD. Address : Ghazlan Power Plan Tel. # 6788308, Fax # 6788420

25. Name : Mr. Fareed A. Al Maghlouth Company/Agency Name : Dammam Municipality Rank/Position : Environmental H. Specialist Address : Dammam Tel. # 8341000 Ext. 688
26. Name : Mr. Hamud Nasser Balkhail Company/Agency Name : Coast Guard Rank/Position : Marine Major Address : Jubail Sector Tel. # 3578037
27. Name : Engr. Mohammed Al - Muaid Company/Agency Name : Ministry of Industry Rank/Position : Ist. Industrial Management Address : Dammam Tel. # 8574369 Fax # 8572509
28. Name : Mr. Mansour H. Al-Ali Company/Agency Name : Civil Defense Rank/Position : Captain Address : Qatif Tel. # No tel. number
29. Name : Mr. Ali H. Al-Shihri Company/Agency Name : Coast Guard Rank/Position : Captain Address : Tel. # 8552533
30. Name : Mr. Abdul Hadi SH. Gahtani Company/Agency Name : Coast Guard Rank/Position : Captain Address : Tel. # 8951010
31. Name : Muaid A. Al-Gahtani Company/Agency Name : Coast Guard Rank/Position : Captain Address : Dammam - Sea port Tel. # 8576611

Environmental Assessment and Water Quality Monitoring Program in the Arabian Gulf

1st Workshop

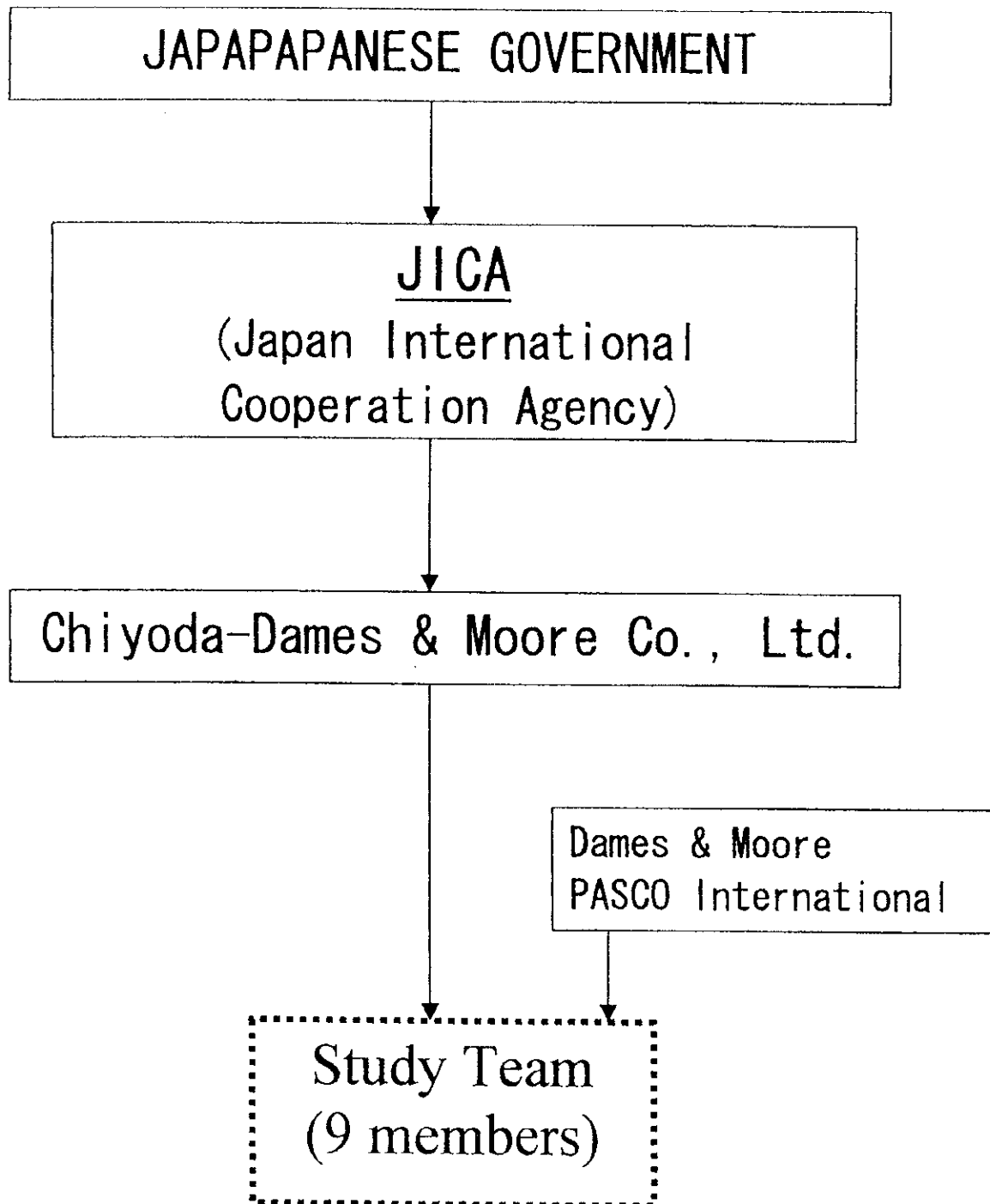


7 July 1999

MEPA & JICA

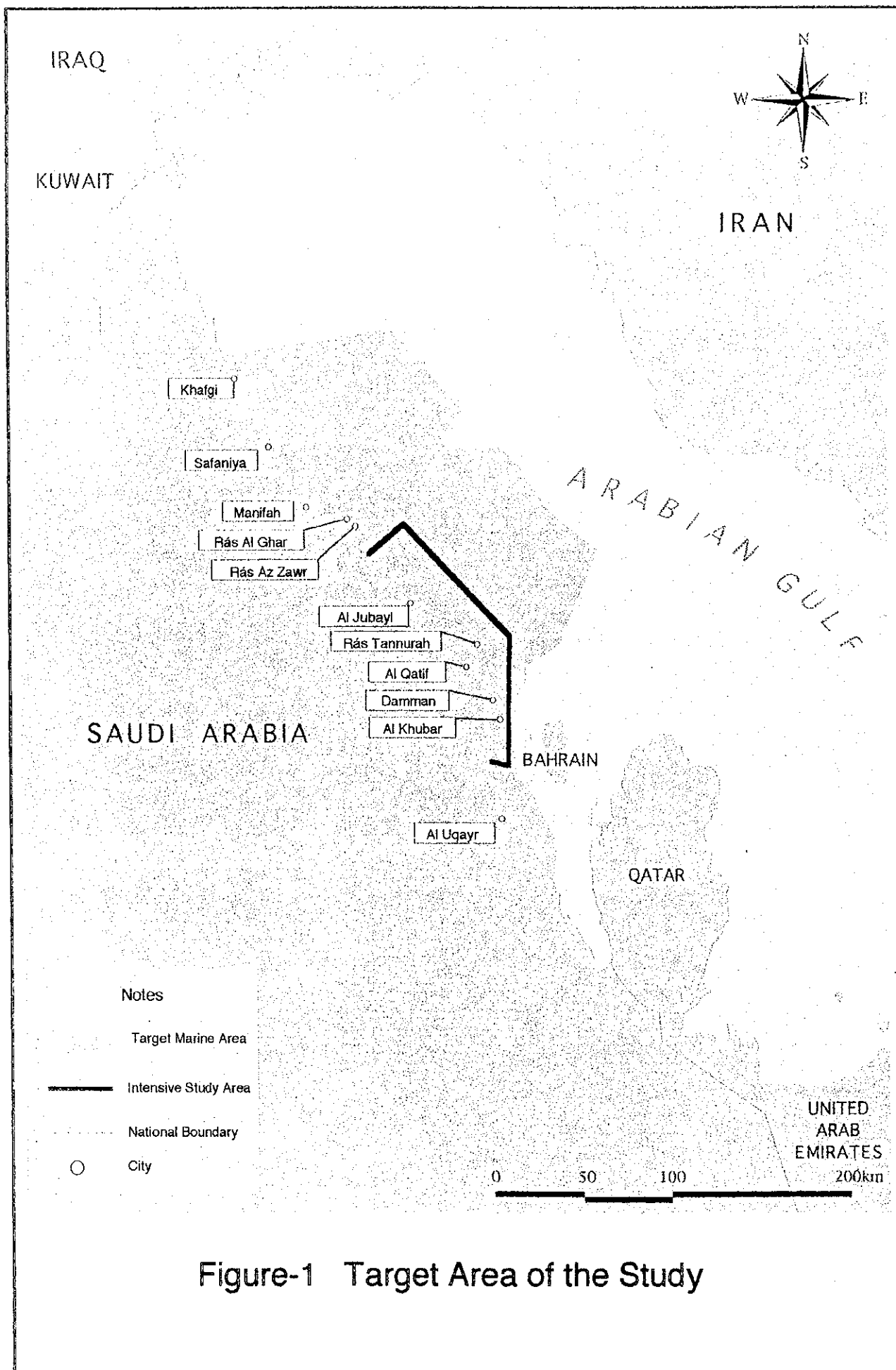
July 7, 1999
Workshop

Introduction of the Work --- Project Summary by Y. SHIMAZU



OBJECTIVES

- 1) Investigate Water Quality and Cause of Degradation
- 2) Help Develop a Comprehensive Monitoring Program
- 3) Strengthen MEPA's Capability



SCHEDULE

(1999)

March Planning of the Project

June–July Field Pre-survey
Monitoring Plan
Workshop

Sept–Nov Installation of Equipment
1st Sampling and Analysis
Data Analysis
Workshop

(2000)

June–July 2nd Sampling and Analysis
Data Analysis

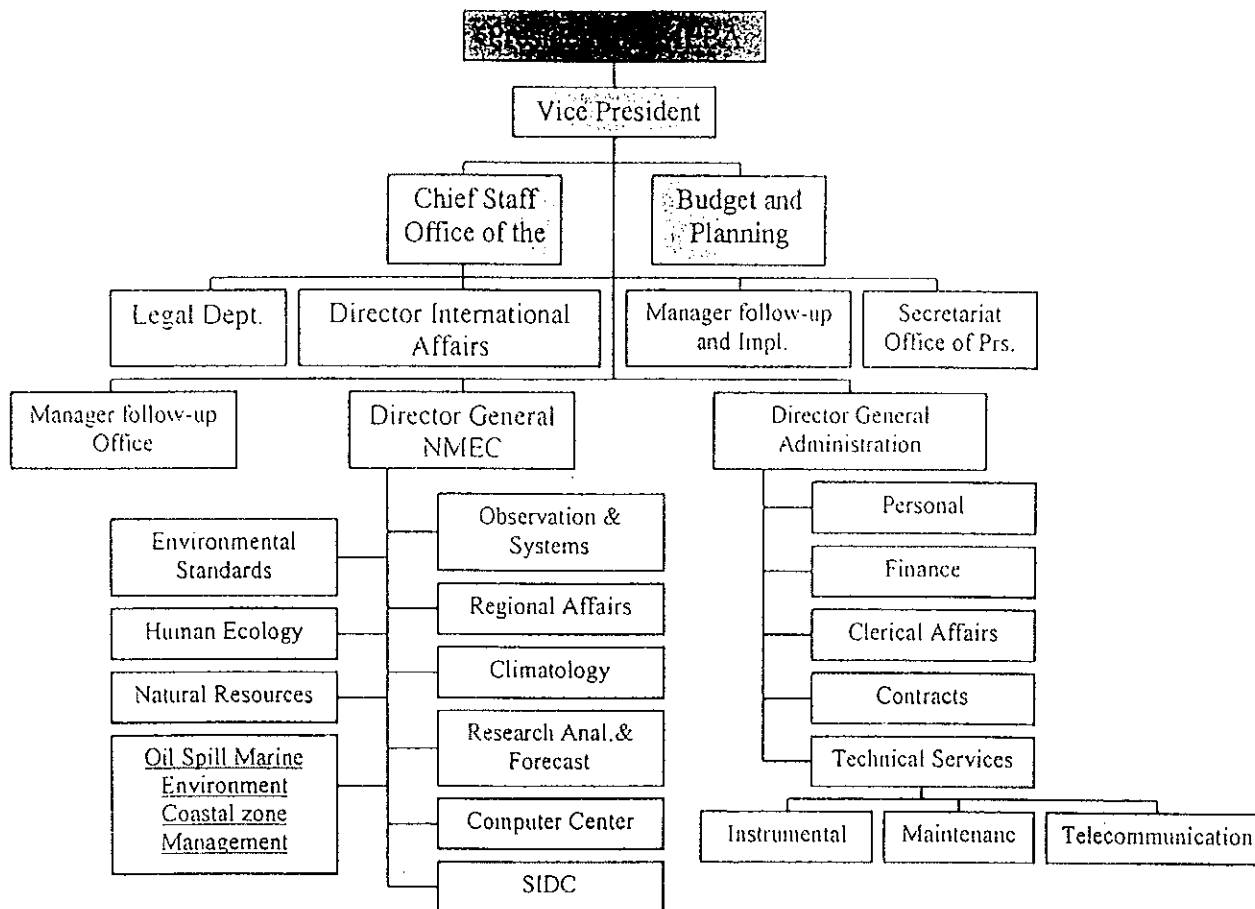
Sept Evaluation
Final Report
Seminar

The Role of MEPA and the Management of Monitoring Program

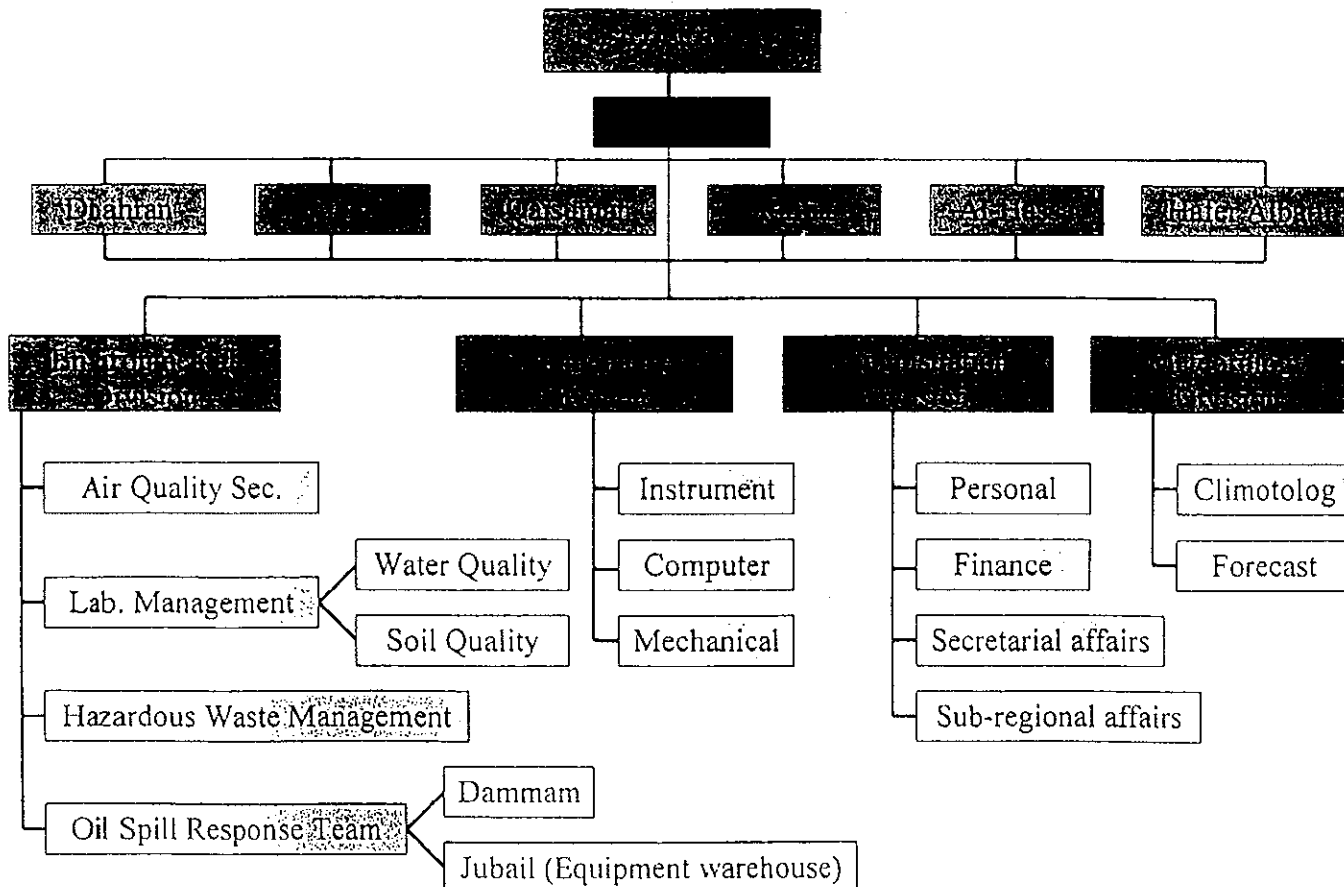
By

Aziz W. Al-Omari

Meteorology & Environmental Protection Administration (MEPA)



Meteorology & Environmental Protection Administration (MEPA)



Industrial Questionnaire

(Data Base prepared on Microsoft Access
to Control the Discharge of Hazardous Industrial Waste)

•Factory Identification:

Factory name, Owner name & Address.

•General Information:

Permit Number, Raw material used, Product
description & etc.

•Waste Water Discharge

Flow rate of effluent, Connection with treatment plant,
Present disposal method, Waste transporter company,
Waste disposal company, waste analysis report & etc.

•Air Pollution

Average annual emission, Estimated fuel consumption,
Air emission analysis report, Pollutants of interest & etc

Project Description

Five Work Stages

Work Stage in Japan

Work Stage in Saudi Arabia

First Stage:

- Data information collection
- Planning of equipment preparation
- Framework of study
- Satellite photography
- Planning of technology transfer

Second Stage:

- Confirmation of study plan
- Field observation
- Intensive study area Characterization, determination & Monitoring planning

Third Stage:

- First round Site work (water quality, sediment quality, tidal flow & plankton)
- Analysis of data collected
- Analysis of Satellite photography

Forth Stage:

- Second round Site work (water quality, sediment quality, tidal flow & plankton)
- Analysis of Data collected & Satellite photography
- Evaluation of Results and Monitoring
- Guideline for Water Quality Monitoring
- Water Quality Monitoring Planing
- Finalization of Technology Transfer

Fifth Stage:

- Valuation of Technology Transfer
- Final report preparation

Table 1

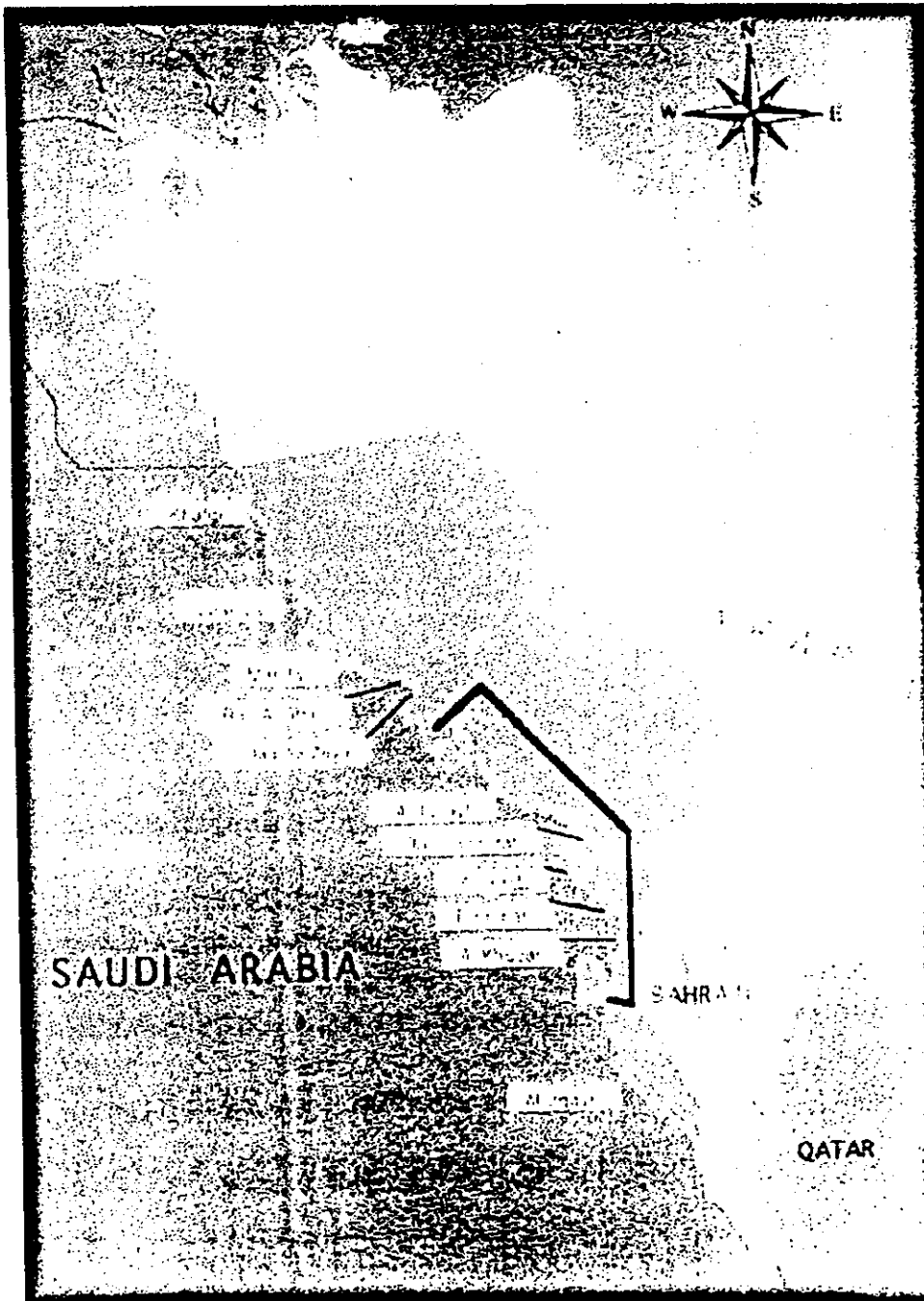
	Coastal and Marine uses	Actual / Potential Environ. Impact
1	Shipping and Transport, Shipping port	Oil Spill, Anchor damage & Habitat loss
2	Residential and commercial development	Coastal reclamation
3	Industrial development, Oil & Petrochemical industry	Oil refinery & other effluent contains heavy metals, drilling mud etc.
4	Desalination Plant, Power plant & Treatment plant	Effluent with elevated temperature, turbidity, heavy metals and other chemical.
5	Fisheries	Population decline at target and non-target species habitat degradation

Human Activities

Since long time in the past people have been attracted to the shores of the Arabian Peninsula. An early civilization of eastern coast of Saudi Arabia prospered four to five thousand years ago even by tenth century AD. The Arabs had established a trade network as China, this was possible through their sophisticated knowledge of astronomy and navigation. Cargoes of textiles and spices were accompanied by the exchange of new ideas, science and new religion. The foundation of life & development in the region remains firmly based on renewable and non-renewable natural sources.

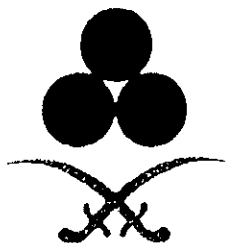
Study Area

- Intensive Study Area
- Target Marine Area



July 7, 1999
Workshop

Design of Water Monitoring by Dr. Robert Hilliard



Meteorological and Environmental
Protection Agency



JICA

E-22

Environmental Assessment and Water Quality
Monitoring Program Workshop

DESIGNING THE MARINE MONITORING PROGRAM

THE PROBLEM:

Sampling programs to detect human environmental disturbance and impacts are often poorly conceived, illogical, badly designed and impossible to interpret.

Poor and illogical field sampling makes irrelevant all of the subsequent analyses that are undertaken carefully in the laboratory, often at great expense.

Unless logical and scientifically sound sampling designs are used by monitoring programs, our understanding of the environment and man's impacts will remain unclear and our management ineffective.

Problems in marine monitoring programs are usually caused by:

lack of clear-cut questions, hypotheses or tests about the relationship between the managed activities and the variables being monitored.

poor recognition/understanding of natural processes or other human activities affecting the monitored variables.

lack of adequate controls or background samples.

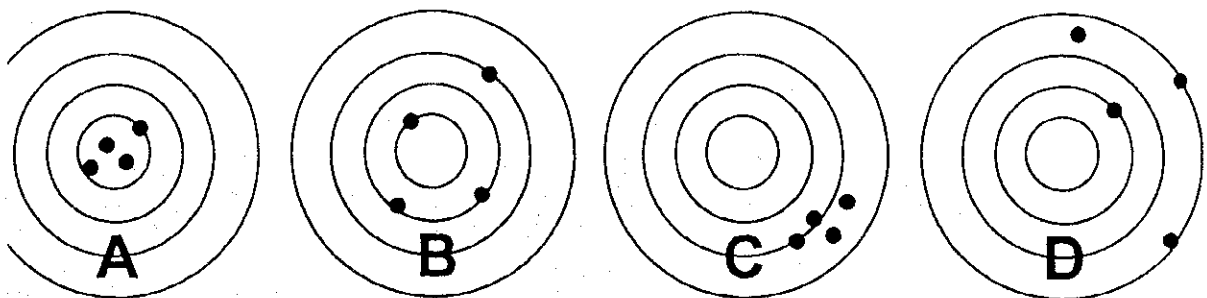
lack of replication over distance, time and method, which prevents meaningful interpretation of the data because:

(a) no results to show the real-world mean and range due to natural variations over distance and time;

(b) no results to show size of errors caused by sampling and measurement methods.

a lack of appropriate statistical tests and statistical power.

PRECISION VERSUS ACCURACY



The 'target range' analogy shows the difference between precision and accuracy. Bullet holes in Target A show high accuracy ('on target') and precision (small spread), whilst Target B represents good accuracy but low precision (wide spread). The bullet holes in Target C show low accuracy and high precision, and the bullet holes in D show low accuracy and low precision.

PROCESSES AND DISTURBANCES CAUSING SPATIAL AND TEMPORAL VARIATIONS ALONG THE GULF COAST

PHYSICAL EVENTS

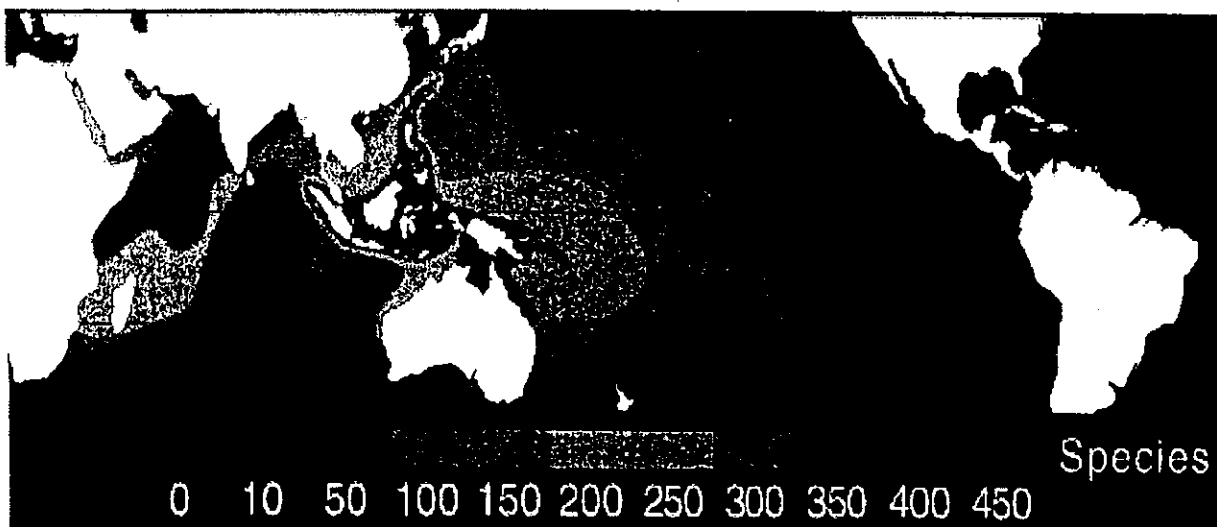
El Niños Storms Frontal events (upwellings) Dust storm inputs
Seasonal winds Episodic rainfall (run-off/seepage) Unusual low or high tides
Extreme temperatures (low/high) Extreme Salinities (low/high)

BIOLOGICAL EVENTS

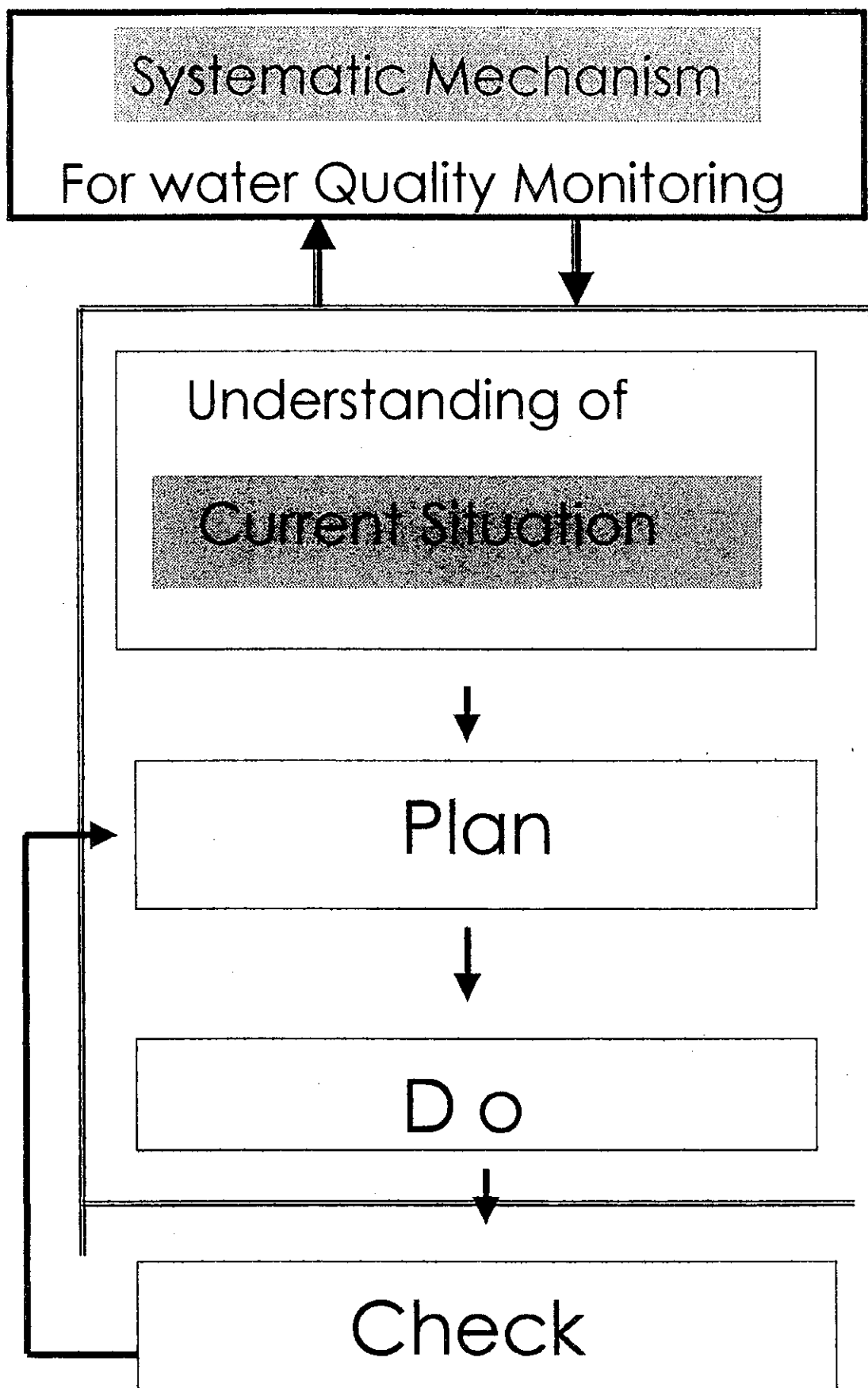
Natural Blooms Mass Spawnings Recruitment/Settlement success variation
Predator 'invasions' Competition (resources/space) Diseases/Parasites

HUMAN ACTIVITIES

Greenhouse Climate change Commercial fishing/trawling Waste Outfalls
Offshore oil/gas fields (pipelines, discharges, spills) Atmospheric inputs (PAHs)
Marinas, harbours and load-out terminals (spills, discharges, rubbish, wastes)
Urban coastal run-off/seepage Recreational boating/fishing (rubbish, litter)
Shipping (discharges, spills, non-native species introduction)
Dredging, Land reclamation, Corniche developments (modify shore line)

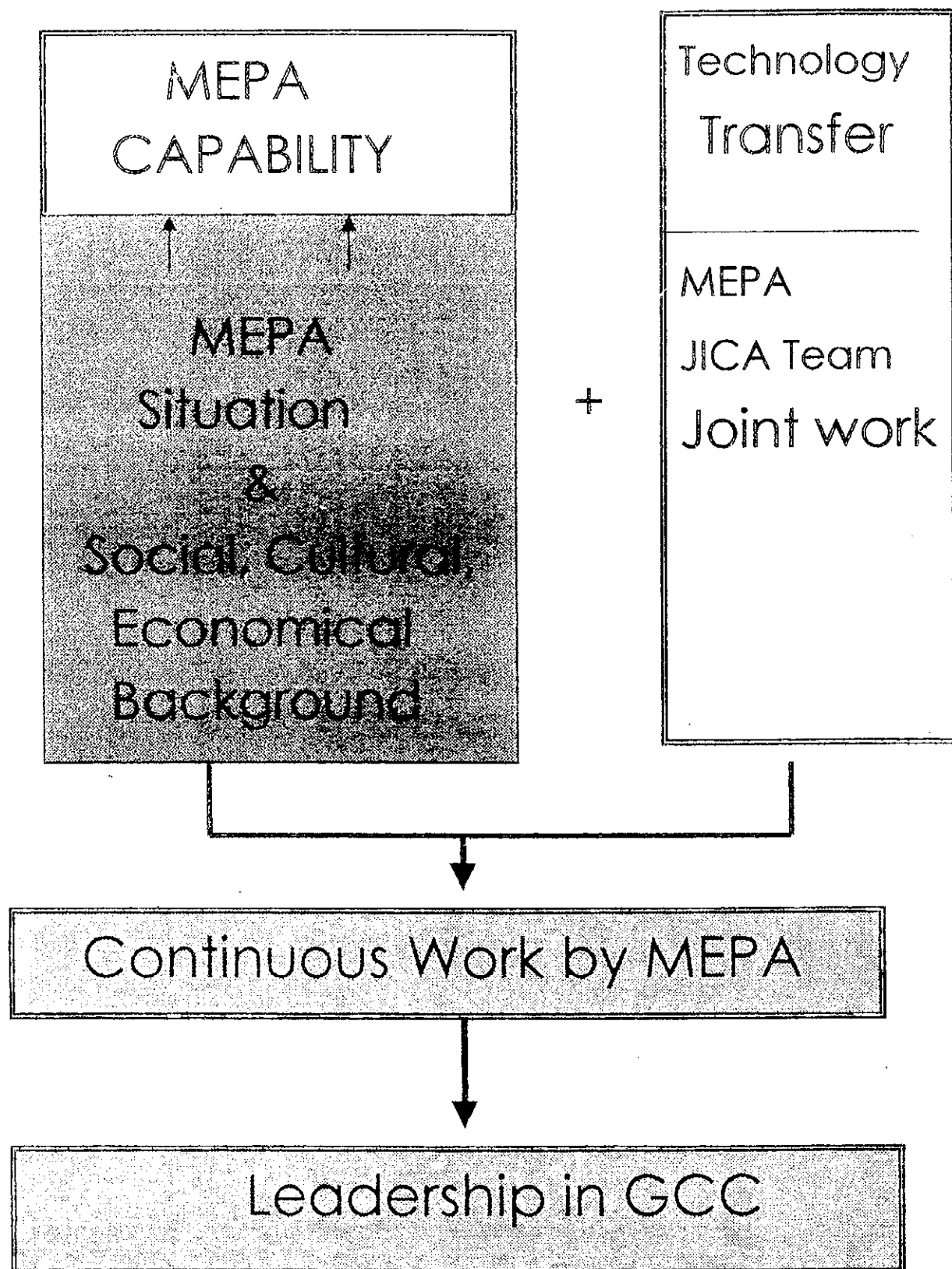


(reproduced with permission from JC Veron)

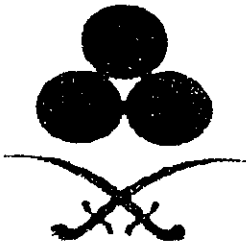


Socio-Economical Framework for the Project.

By Kaz. Tana ka



THE STUDY ON AN ENVIRONMENTAL ASSESSMENT AND MONITORING OF ARABIAN GULF IN SAUDI ARABIA



Khaled S. Al-Rasheed

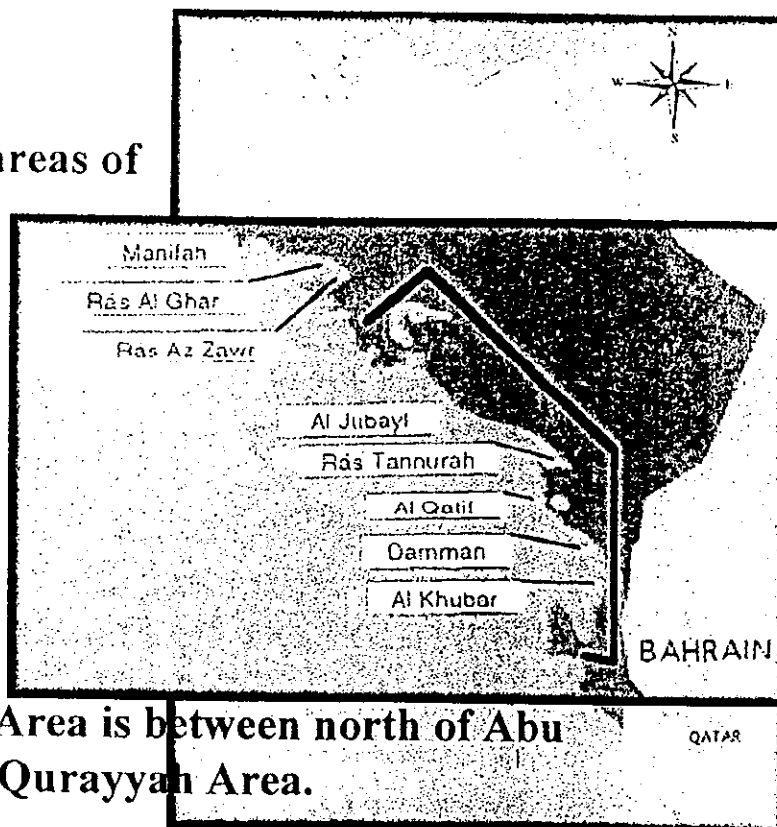


Objectives of the Study

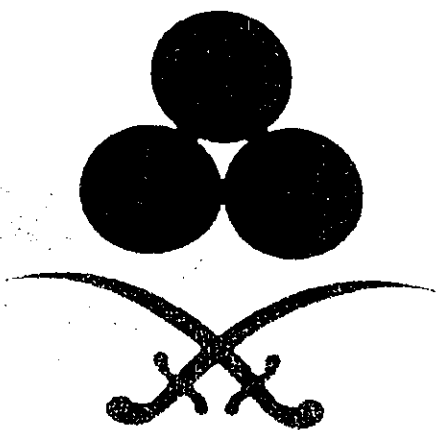
- Examine sea water quality and Identify causes of water quality degradation along the Arabian Gulf.
- Review the existing sea water quality monitoring activities conducted by MEPA and by other parties.
- Strengthen MEPA's capacity through technology transfer to counterpart personnel during the Study.

Area of the Study

- The sea and coastal areas of the Arabian Gulf.



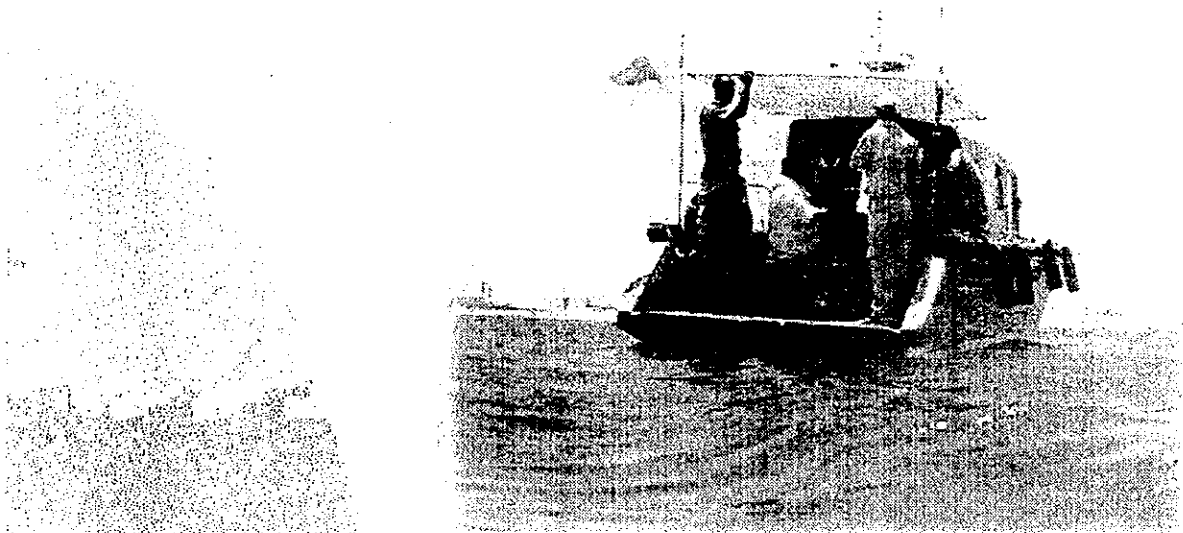
- The Intensive Study Area is between north of Abu Ali Island and Ras Al-Qurayyan Area.



Coast Guard Role in The Study

Why Coast Guard?

- History of MEPA/Coast Guard strong cooperation.
- Can reach every area (e.g. Sensitive intake/out falls).
- Local experience and knowledge.
- Range of vessels along coast.
- Availability of offshore and shallow water vessel.
- Excellent Radio communications for safety.

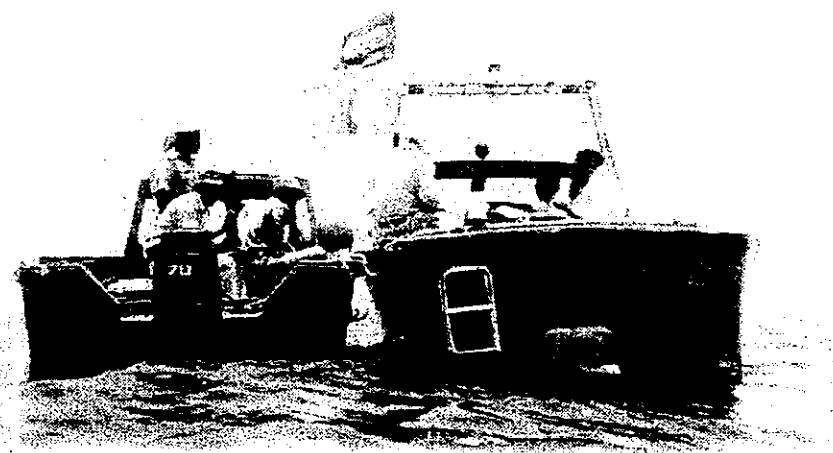


Convenient vessel with a shaded space





A big one for far away points



Two vessels needed in shallow water





Personal Protection from the SUN is needed



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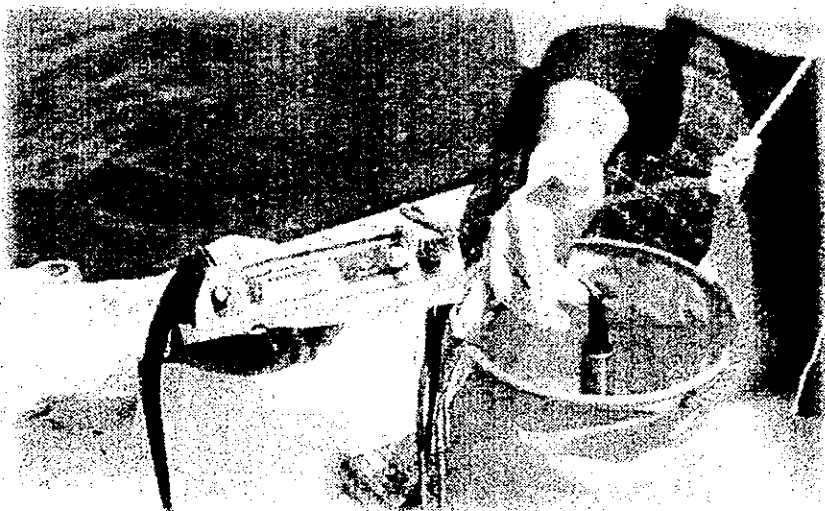


SPEED is No Problem



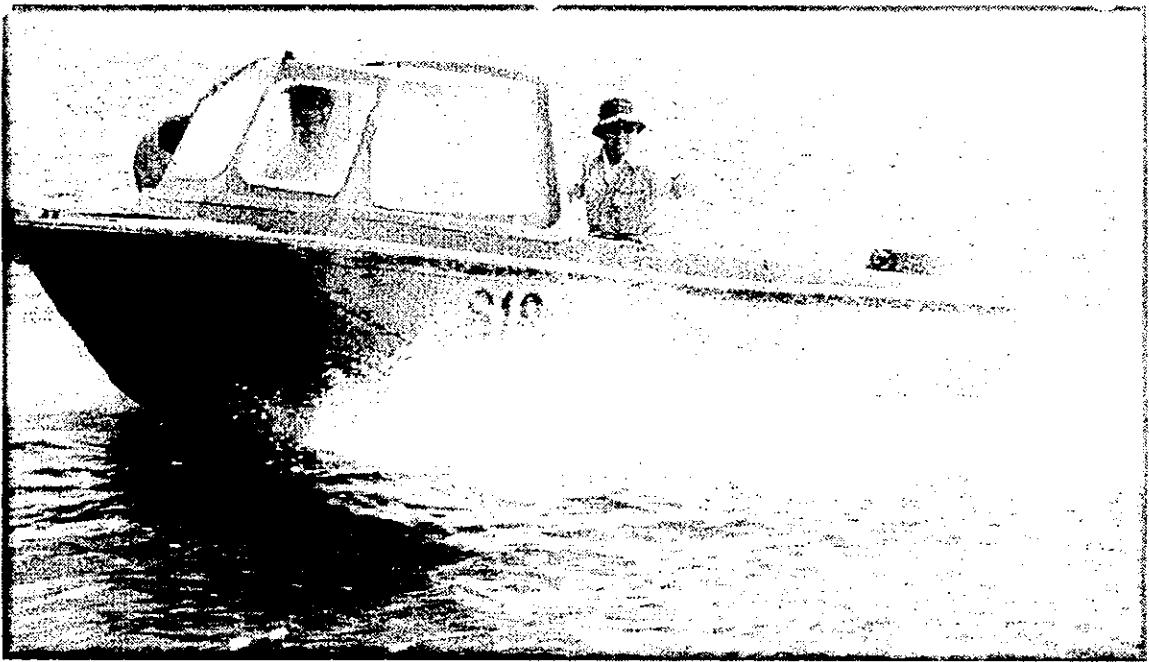


Working Time



Sampling on Spot



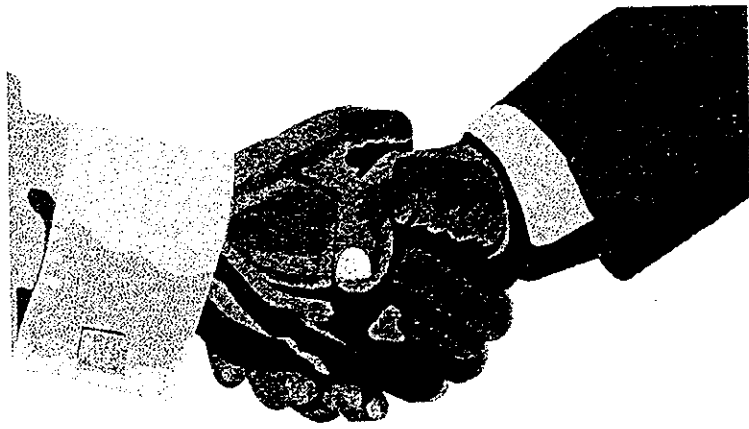


Work is accomplished



Home Safe





Thank You

Question & Answer Summary

MEPA Workshop dated July 7, 1999

The following questions answers were exchanged
between MEPA/JICA Team at Discussion]Session.

- Q1. Is the project team going to do only monitoring work?
Management and engineering solution should be most important.
A1. Your comment is quite right, but this project is not intended to work out solution.
- Q2. I think you will pay much care and attention to the samples while transporting them.
A2 .Yes, we do laboratory test two times for one-spot-water in two bottles so that handling of bottles is very complicated.
- Q3. What are criteria or standards applicable to sampling?
A3. We will refer to standards of K.S.A and other countries for comparison. The standard is going to be internationally unified.
- Q4. Why not use mass-media to publicize MEPA aim and program?
A4. Jeddah Head Office started such activity, but here there is budget problem.
- Q5. Are Japanese water quality standards too strict?
A5. Saudi Standards are rather strict, but enforcement is much weaker than Japan. Anyhow we do not intend to apply Japanese standards or others, because the standards are irrelevant with the project, just for reference and comparison use.
- Q6. How will you be coordinating with Royal Commission?
A6. We have already got in touch with R/C. The data they have collected will be informed to the project team. We like to avoid duplication of work.
- Q7. Tell us the timing of sampling regime, and reason.

- A7. We do monitoring in Oct./Nov.(Autumn) and Jun./Jul.(Summer).
During winter, the water is cool, when stress becomes weak.
- Q8. What type of contaminants will you be examining?
A8. Many types.
 - Q9. What previous data will be used?
A9. We intend to refer to ROPME's, ARAMCO's etc.,
 - Q10. Is the gulf water safe for people?
A10. There is no evidence at moment it is not safe.
 - Q11. Does MEPA have preservation power?
A11. It has to cooperate with Municipality and other government department. As for enforcement of dumping, MEPA can not do it (manpower problem), but it can go to Governor to stop persistent offenders.
 - Q12. Please tell us QA/QC.
A12. We refer to American methods, but we can not reach the level of ISO9001 within 2 years.
 - Q13. What is the basis of JICA effort/funding to the Kingdom.
A13. We do not think that JICA is ready to afford additional, considerable amount of money for this project.
 - Q14. Who handle problems of land-filling and dredging?
A14. Municipality will handle permission, depending upon coastal zone management policy.
 - Q15. Is Socio-Economist only collecting data/information.
A15. At this stage, we need information, but at a later stage, we will make some recommendation based on the information.