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QUARTERLY GROUNDWATER MONITORING WELL SAMPLING REPORT FOR:

1435 WEBSTER STREET ALAMEDA, CA

(September 14, 1994)

SITE DESCRIPTION

1435 Webster Street is located in the northwest portion of the City of Alameda, which is in Alameda County, California (see Figures 1 and 2). This address is on the northwest corner of the intersection of Webster and Taylor Streets, and occupies Alameda County Assessor's Parcel number 74-427-51 (see Figure 3). It is 1.5 miles south of the Webster Street Tunnel, approximately 3.0 miles south of Interstate Highway 880, and 1.0 mile southeast of the former U.S. Naval Air Station. The subject site is currently a City of Alameda public parking lot (street level only). Property use in the area is multi-purpose in nature with commercial, residential, and light industrial usage.

GEOLOGY AND HYDROGEOLOGY

The subject site is located on bay plain deposits approximately ¹/₄ mile east of the San Francisco Bay. The bay is a drowned valley which is thought to have originally been formed by erosion of the ancestral Sacramento River and subsequently widened by subsidence and rise in the level of the sea. Quaternary (Pleistocene to recent) sediments deposited in what is now San Francisco Bay include both shallow marine and continental deposits known as "Bay Mud". The geologic deposits encountered during drilling in January of 1993 consisted primarily of fine to medium, loose to medium-dense, poorly-sorted, brown sand with some gravel. Groundwater was encountered at 11.5 feet below ground surface (bgs).

OVERVIEW OF PREVIOUS ENVIRONMENTAL COMPLIANCE ACTIVITIES PERFORMED AT THE SITE

Removal of Underground Storage Tanks

On October 11, 1988, CHIPS Environmental Consultants, Inc. performed soil gas analyses at the subject site at the request of Accutite Tank Testing and Maintenance Services (a division of Olympian Oil Company) of South San Francisco. The CHIPS study was specific to the area occupied by two (2) 10,000gallon underground gasoline storage tanks, one 7,500-gallon underground diesel storage tank, and one 500-gallon waste oil tank. High soil gas readings were obtained on the east side of one of two (2) gasoline pump islands, between the islands, and from the backfill between the gasoline storage tanks at both 8 and 11 feet below ground surface (bgs). Soil gas concentrations on the west side of the tank pits were relatively low.

All underground storage tanks were removed during September of 1989. Soil samples acquired for certified laboratory analyses attendant to the removal of the tanks contained concentrations of Total Petroleum Hydrocarbons as Gasoline (TPH-G) to 220 parts per million (ppm), Total Petroleum Hydrocarbons as Diesel (TPH-D) to 430 ppm, and 650 ppm Total Oil and Grease (TOG).

Over-excavation of the Former Tank Pits and Attendant Sampling

On January 11, 15, and 23, 1991, exploratory/remedial excavations of the fuel hydrocarbon contaminated soil were conducted by AAA Tank Removal/Forcade Excavation Services (California licensed contractors) under the direction of a staff geologist from Uriah Environmental Services, Inc. (UES) of Livermore/Modesto. The work performed was done in accordance with a workplan previously submitted to, and approved by, the Alameda County Health Care Services Agency (ACoHCSA).

Approximately 550 cubic yards of contaminated soil was removed from the area of the pit(s) previously occupied by the underground storage tanks. At that time, the dimensions of the excavation measured $34'(W) \times 40'(L) \times 18'(D)$. No further excavation was undertaken as the surface of the site was fully occupied by treatment beds constructed for the biological detoxification of previously excavated soil.

Following the bioremediation of the previously excavated soil, excavation activities resumed on September 23-25, 1991. All work was performed by W.A. Craig, Inc. (a California licensed contractor), under the direction of a UES staff hydrogeologist. The excavation was expanded to 34' (W) x 55' (L) x 18' (D), and an additional 300 cubic yards of contaminated soil was removed. During the course

of the expanded excavation, contamination was observed to be confined to sandy clay lenses that were present at various depths along the south wall of the pit.

On September 27, 1991, four (4) discrete soil samples were acquired from the sidewalls of the expanded excavation. These samples were found to be free of detectable concentrations of TPH-G, TOG, and benzene, toluene, ethylbenzene, and total xylenes (BTEX), but contained 21-24 ppm TPH in the diesel range. The "non-standard diesel pattern" reported by the laboratory was previously compared to a tar wrap fabric by running comparative chromatographic standards. This comparative study appeared to confirm the hypothesis that the "non-standard" TPH-D range material detected was composed of partially-degraded, extractable hydrocarbons which comprise a portion of the tar wrap material.

A soil sample acquired from the floor of the expanded excavation was found to contain benzene at 120 parts per billion (ppb), toluene at 16 ppb, and ethylbenzene at 23 ppb.

Bioremediation of Hydrocarbon-Contaminated Soil

Following the excavation of contaminated soil in January, 1991, this material and approximately 50 cubic yards of stockpiled soil remaining from the underground storage tank excavation was configured on-site in quadrilateral beds atop bermed, hydrocarbon resistant liners. The treatment beds were inoculated with a bio-nutrient solution containing common, non-pathogenic, hydrocarbon-utilizing soil bacteria and a dilute commercial fertilizer solution. During the course of treatment, the soil was monitored to determine rates of degradation, soil temperature, moisture, pH, and nutrient levels.

On September 20, 1991, soil samples were acquired and submitted for uncertified analyses. Levels of TPH-G were found to be below the detection limit of 10 ppm, while concentrations of TPH-Oil had been reduced to below the detection limit of 50 ppm. Based upon these results, twelve (12) discrete samples (one for every 50 cubic yards of soil under treatment) were obtained for certified analyses. All samples were free of detectable concentrations of TPH-G, BTEX, and TOG. Ten (10) of twelve (12) samples were found to be free of detectable concentrations of TPH-D, with the two (2) remaining samples containing 16 and 44 ppm TPH-D, respectively. According to UES (and as noted above), these levels of "TPH-D" were not represented by a chromatographic pattern typical of diesel fuel and represented, instead, partially degraded tar wrap.

On December 2, 1991, ten (10) discrete soil samples (one for every 20 cubic yards of soil under treatment) were acquired from approximately 200 cubic yards of contaminated soil remaining under treatment. All samples were found to be free of detectable concentrations of the referenced analytes.

For additional and/or more specific information regarding these sampling and remediation activities (sample locations, methodologies, etc.), please refer to the aforementioned UES workplan and the UES Report, "Installation of Three Groundwater Monitoring Wells" (March 25, 1993).

Installation of Groundwater Monitoring Wells

On January 11 and 12, 1993, three (3) soil borings were advanced on the subject site under the direction of a UES staff hydrogeologist. Discrete soil samples were collected at five-foot intervals between the ground surface and the top of the capillary fringe. The samples collected were submitted for certified analyses for TPH-D, TPH-G, BTEX, and TOG. All samples were found to be free of detectable concentrations of the referenced analytes.

Following completion of the drilling and soil sampling, each boring was converted into a 2-inch inside-diameter groundwater monitoring well (see Figure 4). All work performed was done under the authority of a permit (#92664) issued by the Alameda County Zone 7 Water Resources Agency.

For additional and/or more specific information regarding these borings (boring logs, well construction details, etc.), please refer to the UES Report, "Installation of Three Groundwater Monitoring Wells" (March 25, 1993).

COMPLIANCE MONITORING/ON-SITE GROUNDWATER MONITORING WELLS

According to information made available to BT Associates, the on-site groundwater monitoring wells were developed and sampled by UES at the end of the first quarter of 1993. At the time of this report, however, the analytical results for the initial groundwater samples collected were not available. In April of 1993, UES ceased business operations. In May of 1993, the sampling and reporting responsibilities for the subject site were assumed by BT Associates.

BT Associates first collected groundwater samples from the on-site monitoring wells on June 3, 1993. Subsequent sampling activities were placed on hold until the on-site monitoring wells could be surveyed with respect to mean sea level datum. This work was delayed, however, pending resolution of a separate billing issue between the property owner and the company that was to conduct the survey (as obtaining similar service from another company was also not requested). The issue was (apparently) recently resolved and the survey was completed on September 14, 1994. On that date, the hydraulic gradient was calculated as 0.004 ft./ft., and the direction of groundwater flow was determined to be to the north-west (N08°W).

Following notification of ACoHCSA, BT Associates resumed sampling activities and collected groundwater samples from the on-site monitoring wells on September 14, 1994. Analytical results for the samples collected have been summarized in Table I, below:

		Depth					Ethyl-	Total	
Well #	Date	to	TPH-G	TPH-D	Benzene	Toluene	benzene	Xylenes	TOG
		Water (ft)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppm)
MW-1	6/3/93	na	(Wel	l inaccessi	ble - vehic	le parked	over well	several da	ys)
	9/14/94	11.46	14,000	ND	44	28	25	50	0.8
MW-2	6/3/93	9.54	ND	ND	5.8	ND	ND	ND	ND
	9/14/94	11.82	ND	ND	ND	ND	ND	ND	ND
MW-3	6/3/93	9.80	ND	ND	ND	ND	ND	ND	ND
	9/14/94	12.19	ND	ND	ND	ND	ND	ND	ND
Method Detection Limits	6/3/93	-	50	50	0.2	0.2	0.2	0.6	2
	9/14/94	-	50	50	0.5	0.5	0.5	0.5	0.5
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TPH-G =	Total Petroleu	m Hydrocarbo	ons as Gaso	line		na =	Not analyz	sed.	
IPH-D=	TPH-D = Total Petroleum Hydrocarbons as Diesel ppb = Parts per billion								
ND=	Not detected a	t or above the	Method D	etection Lin	nit	ppm =	Parts per n	nillion	
TOG =	Total Oil and O	Grease							

Well Sampling Methodology

Depth to water and total well depth were measured using an electric tape, and the volume of water within the 2-inch inside-diameter casings computed. Each well was then purged using a clean, disposable polyethylene bailer until the groundwater was free of significant sand, silt, and/or other grit material, and pH, conductivity, and temperature readings stabilized. Over three (3) well volumes were removed from each well. Measurements of pH, conductivity, and temperature were recorded as referenced within Appendix B.

Subsequent to purging the wells, a groundwater sample was collected from each well using a clean, disposable polyethylene bailer lowered to a point just below the water surface. Using a Voss VOC Sampler, each groundwater sample was immediately transferred into two (2) Volatile Organic Analysis (VOA) vials and two (2) one-liter, amber glass bottles. Each sample container was promptly sealed with a teflon-lined screw cap, labeled, placed on ice in an insulated container, and then transported under chain-of-custody to a California statecertified hazardous waste analytical laboratory for analysis for Total Petroleum Hydrocarbons as Gasoline (TPH-G), benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Methods 5030/8015-8020 (602); Total Petroleum Hydrocarbons as Diesel (TPH-D) using EPA Methods 3510/8015; and Total Oil and Grease (TOG) using EPA Method 5520.

Extracted groundwater, in excess of that acquired for laboratory analysis, was taken to Modesto and introduced into a bioreactor currently developing liquid inoculum for use in bioremediation operations.

Results of Certified Laboratory Analyses

The levels of all target analytes were found to be non-detectable (ND) in groundwater samples collected from MW-2 and MW-3 on September 14, 1994. The level of Total Petroleum Hydrocarbons as Diesel (TPH-D) was also ND in the sample from MW-1. Varying levels of Total Petroleum Hydrocarbons as Gasoline (TPH-G), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and Total Oil and Grease (TOG) were detected in MW-1, as follows: TPH-G - 14,000 parts per billion (ppb); benzene - 44 ppb; toluene - 28 ppb; ethylbenzene - 25 ppb; total xylenes - 50 ppb; and TOG - 0.8 parts per million (ppm). Analytical results for the groundwater samples collected have been summarized in Table I (page 5, above, and Appendix A). Copies of all laboratory results as received from the certified hazardous waste analytical laboratory are enclosed within Appendix B.

CONCLUSIONS AND RECOMMENDATIONS

The level of Total Petroleum Hydrocarbons as Diesel (TPH-D) was found to be below the limits of laboratory detection (ND) in all groundwater samples collected on September 14, 1994. The levels of Total Petroleum Hydrocarbons as Gasoline (TPH-G), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and Total Oil and Grease (TOG) were also found to be ND in MW-2 and MW-3.

TPH-G, BTEX, and TOG were detected in MW-1 at the following levels: TPH-G - 14,000 parts per billion (ppb); benzene - 44 ppb; toluene - 28 ppb; ethylbenzene - 25 ppb; total xylenes - 50 ppb; and TOG - 0.8 parts per million (ppm).

As the sampling conducted on September 14, 1994, represents only the second sampling event for the subject site, it is recommended that quarterly ground-water monitoring be continued. The next groundwater sampling event for this site will be scheduled to take place in December, 1994.

Should you have any questions, please feel free to contact either of the undersigned at 510-222-1541.

Sincerely,

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Bruce A. Tsutsui President, BT Associates Registered Environmental Health Specialist (#4522)

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Marvin D. Kirkeby President, Kirkeby Engineering Registered Civil Engineer (#14001)



APPENDIX A

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FIGURES AND TABLES











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Well #	Date	Depth to Water (ft)	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	TOG (ppm)
MW-1	6/3/93 9/14/94	na 11.46	(Wel 14,000	l inaccessi ND	ble - vehic 44	ele parked 28	over well 25	several da 50	ıys) 0.8
MW-2	6/3/93 9/14/94	9.54 11.82	ND ND	ND ND	5.8 ND	ND ND	ND ND	ND ND	ND ND
MW-3	6/3/93 9/14/94	9.80 12.19	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND
Method Detection Limits	6/3/93	-	50	50	0.2	0.2	0.2	0.6	2
	9/14/94	-	50	50	0.5	0.5	0.5	0.5	0.5
TPH-G = TPH-D = ND = TOG =	TPH-G = Total Petroleum Hydrocarbons as Gasolinena = Not analyzedTPH-D = Total Petroleum Hydrocarbons as Dieselppb = Parts per billionND = Not detected at or above the Method Detection Limitppm = Parts per millionTOG = Total Oil and GreaseTOG = Total Oil and Grease								

Table I - Groundwater Sampling Results

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APPENDIX B

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REPORTS OF CERTIFIED LABORATORY ANALYSES CHAIN-OF-CUSTODY AND QA/QC DOCUMENTS WELL MONITORING FORMS



BT ASSOCIATES, INC.
Attn: John Rapp
Re: Three water samples for Gasoline/BTEX, Diesel, and Oil & Grease analyses.
Project name: Ferrar / Olympian
Project location: Webster St., - Alameda
Date sampled: Sep 14, 1994
Date submitted: Sep 16, 1994
Date analyzed: Sep 16-18, 1994

RESULTS:

September 19, 1994

SAMPLE I.D.	Gasoline	Diesel 1	Benzene	Toluene	Ethyl Benzeno	Total	Oil &
	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)
MW-1 MW-2 MW-3	14000 N.D. N.D.	N.D. N.D. N.D.	44 N.D. N.D.	28 N.D. N.D.	25 N.D. N.D.	50 N.D. N.D.	0.8 N.D. N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	89.3%	105.1%	82.6%	82.2%	102.1%	94.3%	
Detection limit	50	50	0.5	0.5	0.5	0.5	0.5
Method of Analysis	5030 / 8015	3510 / 8015	602	602	602	602	5520 C & F

avid Duong Laboratory Director

PEL # 9409056

PRIORITY ENVIRONMENTAL LABS

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PEL # ⁹⁴⁰⁹⁰⁵⁶

INV # 25237

1764 Houret Ct. Milpitas, CA.95035 Tel: 408-946-9636 Fax: 408-946-9663

DATE: 9 14 94 PAGE: 1 OF 1

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ADDRESS: 31 NILATIO	WL CO	9_ <u></u> 27	1200	osoline 030.8015)	asoline(5030,8015) ¢(EPA 602.8020)	iesel 510/3550.8015}	able aromatics EPa 602.8020)	oil & Grease 520 C.D&F)	0ES/PCB 08.8080)	RECOVERABLE CARBONS (EPA 418.1)	NATED CARBONS 01.8010)									ER OF CONTAINERS
SAMPLE ID.	DATE	TIME	MATRIX	1PH-6 (EPA 5	TPH-G */BTE)	трн-0) (СРА 3	PURCE BTEX (TOTAL ((EPA 5:	PESTICI (EPA 6	TOTAL F	CHLORI HYDRO((EPA 6(NUMB
Mw-1	9-14-94	4L'	WATER		¥	r		×												 ч
MW-2	9-14-94	1000 1000 1000	WATER		*	¥		*										<u> </u>		ч
MW-Z	9-14-94	ΨŽ	WATER		¥	۶		×												 4
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INSTRUCTIONS & COMMENTS:	AMPLES C4C	NELLS 7/14-	VNEF-IL		Date: 7-16	- 94	4	Time: SSPt	1	9/16/	<i>₹4</i>	Time: 4:55-PM	Date:			Time:	0	ato:		 Time:
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		B' E	T Associ	ates ervices	(Office) 510-222-1541 (Fax)
	Ŋ	WELL		NG FORM	510-525-2178
CLIENT:	Ferrar	Property	DATE:	Septem	ıber 14, 1994
SITE ADDRESS:	1435	Webster Street	COUN REPRE	TY SENTATIVE:M	s. Juliett Shin
_	Alame	eda, CA	COUN CONT	TY REPRESENTATI	VE AMPLING? <u>Yes</u>
	gallons of 2.067 TOTAL	/linear foot, and is for ". Similiarly, use a con WELL DEPTH23	a 2" diameter, Schedu nversion factor of 0.66	le 40 PVC pipe with for a 4" pipe, which WELL #	an inside diameter has a 4.026" I.D. /-1
	- DEP1	TH TO WATER	46' PURGE METH	DD: Disposable I	Polyethylene Bailer
= WA	TER COL	UMN HEIGHT <u>11</u> .	$\frac{72'}{1} \times 0.17 = 1.00$	99 Gallons (1 w	ell volume)
	Multi to be	iply 1 well volume by purged from monitor	3 to obtain the minimu ing well prior to taking	m number of gallor samples.	is of water
		3 x <u>1.99</u>	= <u>5.97</u> Gallor	s (3 Well Volumes)	
TIM	E	GALLONS	TEMPERATURE (°F)	рН	CONDUCTIVITY µmhos/cm
134.	5	0	80.3	4.63	4810
140	0	2	81.1	4.84	5280

80.2

80.6

1412

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CONTAMINANT OD	No	
TURBIDITY LEVEL: _	Mod	lerate

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No SHEEN ON WATER?

TIME OF SAMPLE C	1430	
WITNESSED BY:	No Witness	
SAMPLER'S SIGNA		- Our
	(John R	app)

4.77

5.15

5310

5350

		I 31 Nigi	Environmental S ntowl Court, Richmo	ervices and, CA 94803	510-222-15 (Fax) 510-525-21
		WELI	. MONITORI	NG FORM	
CLIENT:	Ferrar	Property	DATE	Septen	nber 14, 1994
SITE ADDRESS:	1435 V	Nebster Street	COUN REPRE	TY SENTATIVE:M	s. Juliett Shin
	Alame	da, CA	COUN CONT	TY REPRESENTATI ACTED PRIOR TO S	IVE SAMPLING? <u>Yes</u>
Note 2: = WAT	The 0.17 gallons, of 2.067 TOTAL - DEPT ER COLU Multi to be	figure used below to figure used below to figure foot, and is fo Similiarly, use a co WELL DEPTH H TO WATER H TO WATER JMN HEIGHT ply 1 well volume by purged from monitor 3 x 3 x 1.96	b convert WATER COI r a 2" diameter, Schedu mversion factor of 0.66 3.40' MONITORING .82' PURGE METH .58' x 0.17 = 3 to obtain the minim- ring well prior to takin _ = Gallor	UMN HEIGHT to g the 40 PVC pipe with for a 4" pipe, which WELL # <u>MW</u> OD: <u>Disposable F</u> OD: <u>Disposable F</u> Gallons (1 w um number of gallor g samples. ns (3 Well Volumes)	allons has units of an inside diameter has a 4.026" I.D. <u>V-2</u> <u>Polyethylene Bailer</u> rell volume) hs of water
ТІМІ	E	GALLONS	TEMPERATURE (°F)	pH	CONDUCTIVITY 4mbos/cm
1310		0	77.7	4.66	8390
1315		2	77.8	4.74	7740
1320		4	75.1	4.76	6070
1325		6	73.8	4.91	5690
		<u> </u>			
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CONTAMINANT ODOR? <u>No</u>	TIME OF SAMPLE COLLECTION: 1330
TURBIDITY LEVEL: Moderate	WITNESSED BY: No Witness
SHEEN ON WATER? No	SAMPLER'S SIGNATURE:
	(John Rapp)

	(Office) 510-222-1541 (Fax) 510-525-2178					
CLIENT:	CLIENT: Ferrar Property			. S	eptember 14, 1994	
SITE ADDRESS:	1435 Webs	ter Street	COUN REPRE	TY SENTATIVE: _	Ms. Juliett Shin	_
_	Alameda, (<u>A *</u>	COUN CONT	TY REPRESEN	TATIVE TO SAMPLING?	Yes
= WA1	TOTAL WEL - DEPTH TC ER COLUMN Multiply 1 to be purge	L DEPTH2 WATER1 HEIGHT1(well volume by cd from monitor 3 x1.86	$\frac{3.18'}{2.19'} \text{ MONITORING}$ $\frac{3.18'}{2.19'} \text{ PURGE METH}$ $\frac{3.99'}{2.19'} \times 0.17 = 1.23 \text{ to obtain the minimuzering well prior to taking}$ $= 5.58 \text{ Gallon}$	WELL # DD:Dispose 86 Gallons m number of g samples. s (3 Well Volum	MW-3 <i>MW-3</i> <i>able Polyethylene Be</i> (1 well volume) gallons of water mes)	 uiler
			TELOEDATIDE			
TIM	E	GALLONS	(°F)	pH	CONDUC	/cm
131:	5	0	78.5	4.70	660	0
131	7	2	76.1	4.86	628	0
1322	2	4	79.5	4.95	626	0

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1317	2	76.1	4.86	6280
1322	4	79.5	4.95	6260
1328	6	75.1	4.90	6170
+			<u> </u>	
CONTAMINANT O	DOR? <u>No</u>	TIME OF SA	TIME OF SAMPLE COLLECTION: _	

 CONTAMINANT ODOR?
 No
 TIME OF SAMPLE COLLECTION:
 1340

 TURBIDITY LEVEL:
 Moderate
 WITNESSED BY:
 No Witness

 SHEEN ON WATER?
 No
 SAMPLER'S SIGNATURE:
 (Bruce Tsutsui)