RIVERTECH INC

MEMORANDUM

TO: Mary Beth Broeren, City of Huntington Beach
FROM: Hasan Nouri, Rivertech Inc.
DATE: September 17, 2002
SUBJECT: Explanation of Conceptual Plans described in Rivertech's 1998 and 2002 reports and responses to the Coastal Commission's comments.

This Memorandum in addition to the Memorandum submitted to you on September 10, 2002 respond to the concerns expressed by the State of California, Coastal Commission (Commission) in their letter of September 9, 2002: Previous to these memorandums we have prepared the following reports:

- Urban Runoff Water Quality Analysis and Conceptual Water Quality Control Plan, Prepared by Rivertech Inc., December 1998
- Addendum to Urban Runoff Water Quality Analysis and Conceptual Water Quality Control Plan, Prepared by Rivertech Inc., February 2002.

First, please note that both reports are "conceptual" levels of studies. The purpose of the reports was to provide project guidance to mitigate the water quality impacts of the planned Parkside Estates development. In 1998, none of the planned residential developments in Orange County at that time provided that level of detail. In fact, CEQA documents typically only provide the general level of analysis provided on pages 5-138, 5-141 through 5-142 of the EIR including mitigation measures 2 and 3 (recommended by RWQCB) which require the applicant comply with NPDES requirements and obtain the necessary permits

Second, Rivertech Inc. agrees with the staff of the Commission that urban runoff produced by residential developments usually contain such pollutants as pesticides and synthetic organic pollutants; nutrients; bacteria; heavy metals; oil, grease, gasoline, and other automotive fluids; sediments; trash and particulate debris; oxygen demanding substances; and variety of other contaminants. To control the discharge of these pollutants to the downstream receiving waters the 2002 Addendum identifies Best Management Practices (BMPs) including a treatment train, which will reduce the water quality impacts to less than significant levels. As required by the City conditions, prior to the issuance of grading permits, we will prepare an Urban Runoff Management Plan (URMP) that will describe and identify that treatment train. In addition, the URMP will recommend Site Design Standards as well as Source Control BMPs. The URMP will review a wide variety of design and treatment modalities and will create a treatment train capable of achieving regulatory compliance. Among the design and treatment modalities the applicant will consider are the following:

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ATTACHMENT NO. 3.12

1-Continuous Deflection Separation (CDS):
The CDS unit is highly effective in removing sediments, trash and debris from urban runoff. In a study conducted for stormwater flow in Brevard County, Florida by the CDS Technologies the following removal rates of pollutants were achieved.

TABLE 1
CDS Constituent Removal Efficiencies in Percent

Storm No.	BOD	COD	TSS	Phosphorus
1	18	27	50	29
2	32	25	50	27
3	63	53	70	30

In a study performed by Professor Michael Stenstrom, Professor of Environmental Engineering at UCLA (CDS Performance Review Manual – Table 6) it is shown that the CDS unit is 80 to 90% effective in the removal of free oil/hydrocarbons from urban runoff. In addition, since the CDS unit is a highly effective liquid/solid separator, pollutants that are attached to sediments will be removed to some degree. However, many pollutants that are adsorbed to the fine sediment particles will escape the CDS unit. Therefore, additional BMPs must be employed in the planned Parkside Estates.
A CDS unit is currently in operation in the City of Huntington Beach within a project named "The Boardwalk". The project, being a residential development, was developed by PLC of Newport Beach. The CDS unit was designed for the *first flush* wet weather flow. The dry weather flow, however, after being screened through the CDS unit is diverted to the sanitary sewer line.

2-StormFilter:
This system manufactured by Stormwater Management consists of vertical cylinder with media of various types placed in the cylinder. Water enters laterally through the filter, enters a vertical cylinder well which exits to an underdrain system. Due to limited capacity application of this system in the Parkside Estates will require surface or underground storage areas.
The URMP will investigate appropriate locations within the Parkside Estates where StormFilters can be used. Studies[1] have shown the following efficiencies in removing pollutants from urban runoff by this system.

TABLE 2
Constituent Removal Efficiencies by StormFilter in Percent

Investigator	TSS	Cu	Pb	Zn	O & G	COD	TPH
Stormwater, 1994	92	65	82	83	81	70	84
Lief, 1998	43	33	50	29			
Woodward, 1998					74/69		

[1] Final Report; Investigation of Structural Control Measures for New Development; Prepared for Sacramento Stormwater management Program; Prepared by Larry Walker Associates, Inc, November 1999.

ATTACHMENT NO. 3.13

3-Grass Swales:

Grass Swales are channels having mild slopes and covered with grass. Runoff is directed to the grass swales before discharging into storm drains. Within the Grass Swales treatment takes place through a variety of physical, chemical and biological mechanisms as the runoff flows to and along the Grass Swale. Treatment efficiency is largely a function of depth of flow relative to grass height and velocity of flow. Table 3 lists the performance data of Grass Swales.

TABLE 3
Percent Removal of Pollutants by Grass Swales

Data Source/ Reference	TSS	Cu	Pb	Zn	O&G	Other
Khan, 1992	83	46	67	63	75	TP-29; FC-(70)
Khan, 1992	72	10	25	15	49	TP-50;FC-64
Goldberg, 1993	68	42 (21)	62			TN-31;TP-4.5
King, 1995	67	-35	6	-3		TP-39
Barrett, 1998	87, 85		17, 41	91, 75		TOC-51,53 FC-neg
Schueler, 1994(a)	81	56	50	69		TN-52; TP-17; Cr-37
Schueler, 1994(a)	87	89	90	90		TN-84; TP-83; Cr-88
Schueler, 1994(b)	65	28	41-55	49		TKN-17; TP-41; Cr, 12-16
Schueler, 1994(b)	-85	14	18-92	47		TKN-9; TP-12 Cr, 22-17
Schueler, 1994(b)	98	62-67	67-94	81		TKN-48; TP-18 Cr, 51-61
Evans, 1994	60	66 (0)	62	94 (82)		TP-40

4-Sand Filters:

Sand filters within Parkside Estates may be constructed as underground facilities. In general, sand filters are feasible at locations where space is limited for the construction of detention or retention basins. Sand filters are excellent BMPs for the removal of bacteria. Table 4 shows the efficiency of sand filters in removing pollutants as well as bacteria from urban runoff[2]. Removal efficiencies shown in Table 4 are based on data collected from 13 monitoring studies.

Proper operation of filter systems such as sand filters requires frequent maintenance program. Urbonas et al[2] (1997) found that the hydraulic conveyance of a sand filter decreased from 3 feet-

[2] EPA Preliminary Data Summary of Urban Storm Water Best Management Practices, EPA-821-R-99-012, August 1999

ATTACHMENT NO. 316

per-hour per-square-foot of filter area to less than 0.05 feet-per-hour after only several storms. Therefore, use of sand filters within Parkside Estates will require an efficient maintenance program.

In order to provide treatment for the first flush as well as dry weather flow sand filters must be placed off-line. This would require the construction of a diversion structure (Smart Box) upstream of sand filters to bypass stormwater in excess of the first flush flow.

TABLE 4
Pollutant Removal Efficiency of Sand Filters in Percent

Parameter	Median or Average Removal Efficiency (percent)	Range of Removal (percent)		Number of Observations
		Low	High	
Soluble Phosphorus	-31	-37	-25	2
Total Phosphorus	45	-25	80	15
Ammonia-Nitrogen	68	43	94	4
Nitrate	-13	-100	27	13
Organic Nitrogen	28	0	56	2
Total Nitrogen	32	13	71	9
Suspended Solids	81	8	98	15
Bacteria	37	36	83	5
Organic carbon	57	10	99	11
Cadmium	26	N/A	N/A	1
Chromium	54	47	61	2
Copper	34	22	84	9
Lead	71	-16	89	11
Zinc	69	33	91	15

Using the above structural and nonstructural BMPs and the pollutant removal rates indicated in Tables 1 through 4 as well as the EPA's National Urban Runoff Program (NURP) Event Mean Concentrations (EMCs) data the URMP will evaluate the pollutant loads under Existing and Developed Conditions. As indicated in Rivertech Inc.'s 1998 and 2002 reports the URMP will be based on treating urban runoff from the planned Parkside Estates development as well as an existing development having a drainage area of 21.8 acres. The number and size of the BMPs will be selected such that pollutant loads to the receiving waters under Developed Condition will be less than Existing.

IMPACTS TO RECEIVING WATERS

Runoff from the planned Parkside Estates will be released into the Slater Channel from where it will be pumped to the East Garden Grove Wintersburg Channel (EGGWC) which discharges into Bolsa Bay. Bolsa Bay in turn discharges into Huntington Harbor. Through tidal action and oceanic processes it is possible for the runoff from the Bolsa Bay to reach the Bolsa Chica Reserve when the tide gates are open.
The State of California Regional Water Quality Control Board-Santa Ana Region (RWQCB-SR) has listed Huntington Harbor as an impaired body of water but not the EGGWC. However, it must be mentioned that EGGWC is a source of impairment.

Impairment exists when a surface water body does not meet the water quality standards assigned to it. In other words, impairment can exist if numeric or narrative water quality objectives are not met, or if beneficial uses are not being attained. Impaired waters are made public in accordance with CWA Section 303(d). The regulatory response to a 303(d) listing is to develop a Total Maximum Daily Load (TMDL) for the water body and the pollutants causing impairment.

TMDLs have not yet been established for Huntington Harbor or EGGWC. According to RWQCB-SR TMDLs for Huntington Harbor is tentatively scheduled to begin in 2007. Realizing the sensitivities and constraints of the water bodies that receive runoff from the planned Parkside Estates, Rivertech's URMP will identify solutions that will not degrade the quality of receiving waters as compared to existing. This can be achieved by recommending structural and nonstructural BMPs that would be integrated with the planned development. These BMPs will treat urban runoff not only from the planned development but also from an existing development having a drainage area of 21.8 acres situated to the northwest of the Parkside Estates. The level of bacteria in EGGWC and Huntington Harbor, which is a major concern, after the planned Parkside Estates development should be less than existing. Because the drainage area from Parkside Estates is very small as compared to that draining to EGGWC, the improvement in water quality in EGGWC will not be significant.

LOW FLOW DIVERSION

In managing stormwater and urban runoff from the planned Parkside Estates three different types of flow are classified:

- **Storm Flow:** Storm flow discharges to Slater Channel by gravity when flap gates at Slater Channel are open.
- **First Flush Flow:** A portion of this flow may be released by gravity while the remainder might be pumped to Slater Channel. The proportions of gravity and pumped flows will depend on upstream hydraulic conditions as well as tailwater elevation in the Slater Channel. All of the First Flush Flow will receive treatment before discharging to the Slater Channel.
- **Low Flow or Dry Weather Flow:** The majority of this type of flow may have to be pumped to Slater Channel because the flap gates during non-storm periods may be closed. All of this type of flow will also receive treatment before discharging into the Slater Channel.

I hope my two memorandums have responded to the concerns expressed by the Commission staff. If you have any questions or require further information please do not hesitate to contact me at (949) 586-6127 or on my mobile telephone which is (949) 233-8286.