DRAFT STORM WATER MANAGEMENT PLAN

FOR

Haystack Landing

3355 Petaluma Boulevard South
Petaluma, California

Prepared For:
Dutra Materials
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San Rafael, CA

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CSW | ST2

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1. PROJECT SETTING

1.1 Project Description

The Dutra Group is proposing to establish an asphalt plant facility and associated conveying system to the approximately 37-arce Haystack Landing project site, located at 3355 Petaluma Boulevard South bordering Petaluma in Sonoma County, California. The facility will take delivery of aggregate and sand from the existing Landing Way barge offload facility, conveying aggregate and sand over Landing Way to the Haystack Landing site where it will be either processed directly into the finished asphalt product or sold as aggregate and sand directly to the public. The offloading will occur at the Landing Way barge off-loading facility (owned by Shamrock Materials, Inc.) located at 210 Landing Way in Petaluma, and will be transferred by an enclosed electric conveyor on the Landing Way property, over the Barton property to the south, and cross over the railroads and onto the Haystack site. At the Haystack site, the material will be deposited into stockpiles at the proposed asphalt facility.

1.2 Impervious Surface and Proximity

The site is divided into 4 major areas: Area "A" which is the Barton property and is the most eastern parcel next to the Petaluma River, Area "B" which is the northern most parcel upslope, Area "C" which contains the proposed asphalt plant and the temporary storage and parking area, and Area "D" which is the southern parcel and contains the habitat restoration area. Currently all sites are lightly vegetated with brush and shrubs. The site gently slopes from Area "B" towards Area "D" from an elevation of +15.0 feet to about +/- 1.0 feet. The majority of the existing site consists of alluvial materials consisting of sands, silts, and clays. The northern and western portions of the site have a subsurface condition of approximately 3.0 to 5.0 feet of colluvium, consisting of stiff to very stiff, low to medium plasticity sandy and gravely clay, overlying weathered sandstone. The southern and eastern portions of the site are reclaimed marsh areas with a subsurface consisting of 6.5 to 11.0 feet of variable fill, consisting of soft to very stiff, high to low plasticity sandy and silty clays and dense clayey sands. Soft, highly compressible Bay Mud varying in thickness from 8.0 to 13.5-feet underlies this fill. The clay soil discourages infiltration. (See Miller Pacific report dated September 3, 2004 for specific information)

The water body receiving runoff from the project is the Petaluma River located adjacent to the development.

1.3 Estimate of Pre-Development and Post-Development Runoff

Pre-development runoff consists of water sheet flowing to drainage ditches categorized as DD1, DD2, DD6, DD5, and WJ on the jurisdictional plat dated. These ditches ultimately convey water to the southern portion of the site, area "D", or in the case of WJ, outlets at the existing wooden culvert. Flow from the site will eventually be discharged into the Petaluma River. Post-development runoff was

calculated utilizing flow based hydraulic sizing. The treatment controls selected for the site were based on this sizing criteria. Refer to Appendix 5.1 for calculations on the pre-development and post-development runoff.

1.4 Identified Pollutants of Concern

The project pollutant sources include stockpile areas, driveways, and areas of plant operation. The pollutants of concern are sediment, pesticides, pathogens, trash and debris, metals, total petroleum hydrocarbons, and oil and grease. See below for a chart showing specific chosen waste descriptions and disposal methods.

Waste Description	Quantity	Interval	Disposal Method
Asphalt Concrete	10 tons	daily	recycled into finished asphalt
Heating Oil - Chevron Heat 46	100-200 gallons	every 5 years	recycled by third party, IE Fremouw Environmental
Gear Oil	500 gallons	annually	recycled by third party, IE Fremouw Environmental
Hydraulic Oil	500 gallons	annually	recycled by third party, IE Fremouw Environmental
Trash	5 yards +/-	Weekly	Picked up by local agency
Septic	345 +/-	daily	On-site septic field

2. SITE DESIGN

Site design characteristics are proposed to protect natural resources by reducing or eliminating water pollution. Reduction or elimination of water pollution can be accomplished by reducing impervious cover, promoting infiltration into the ground, filtering runoff through sand filter areas and eliminating contaminant sources.

2.1 Types of Best Management Practices (BMP) Selected to Mitigate Pollutants

Source Controls:

Site Design/Low Impact Development: During site design care was taken to protect sensitive areas and minimize changes to the natural areas including the wetland areas and the existing drainage ditches. Sand filtration areas and permeable aggregate have been incorporated into the site drainage design.

Trash Enclosures: Trash enclosures will be constructed throughout the site. All trash enclosures will be covered and include a drain plumbed to the sanitary sewer which will prevent pollutants from entering the runoff areas (or storm drain systems).

Stockpile Areas: Drainage from stockpile areas will be directed towards the onsite sand filtration systems. Polluted runoff from these areas will not be allowed to directly discharge into storm drain systems.

Operational Source Controls: Routine inspection of on-site storm drains will be performed. See the Operations and Maintenance Manual for schedule.

Stencils: Stencils will be placed at all inlet structures to indicate that runoff drains to the Petaluma River.

Vegetation: Native trees, shrubs, and groundcover on the site will be preserved to the maximum extent possible. The proposed berm, existing berm on Landing Way, Area "A", and Area "D" will be enhanced with additional native vegetation.

Spill Cleanup: On-site maintenance personnel will be trained to respond to most small spills. Spill cleanup packages will be on-site and will include, at a minimum, absorbent pads to clean most petroleum related spills. For other hazardous or unmanageable spills personnel will follow other response procedures that include notifying appropriate local authorities. See the Spill Prevention Control and Countermeasures Plan (SPCC) for additional information on the maintenance and cleanup for the asphalt plant itself. The sand filter areas are also required to have a shut off control valve to prohibit contaminants from entering receiving drainage ditches.

Catch basins and mechanical treatments are also required to have an emergency shut off system to stop discharge from catch basins.

Treatment Controls:

Sand Filtration Areas: Sand filtration areas are located throughout the site to treat runoff from the developed areas of the site. Runoff will flow into these areas and be treated by flowing through the sand and media filters. A subsurface drain connects the two systems to one another. The target constituents in runoff treated by sand and media filtration facilities include oils, grease, sediment, trash, metals, bacteria, organics, and nutrients.

2.2 Types of BMP's Selected to Mitigate Channel Forming Discharges

Drainage facilities were designed to ensure discharge velocities from the site storm drain system into the Petaluma River would not be channel forming.

2.3 Treatment Control BMP Sizing

Sizing for sand filtration areas are included in the calculations appendix.

2.4 Responsibility for BMP Maintenance

The development owner or operator will be responsible for the long term maintenance of the proposed source and treatment control measures. Regular inspections will be required and samples will be collected during storm events where discharge occurs. See the Operations and Maintenance Manual.

2.5 Location and Design of BMP's

A plan has been prepared to show the location of various BMP measures. Refer to Stormwater Control Plan in Appendix 5.2.

3. CONCLUSIONS

The Haystack Landing Project meets the objective to satisfy the requirements of the County of Sonoma and the December 14th, 2010 Conditions of Approval. By filtering runoff through Best Management Practices such as sand filtration areas, and eliminating and containing contaminant sources, the project can implement a stormwater management plan that captures and treats the stormwater runoff from the average annual rainfall over the site.

5.0 APPENDICES

Appendix 5.1 – BMP Sizing Calculations

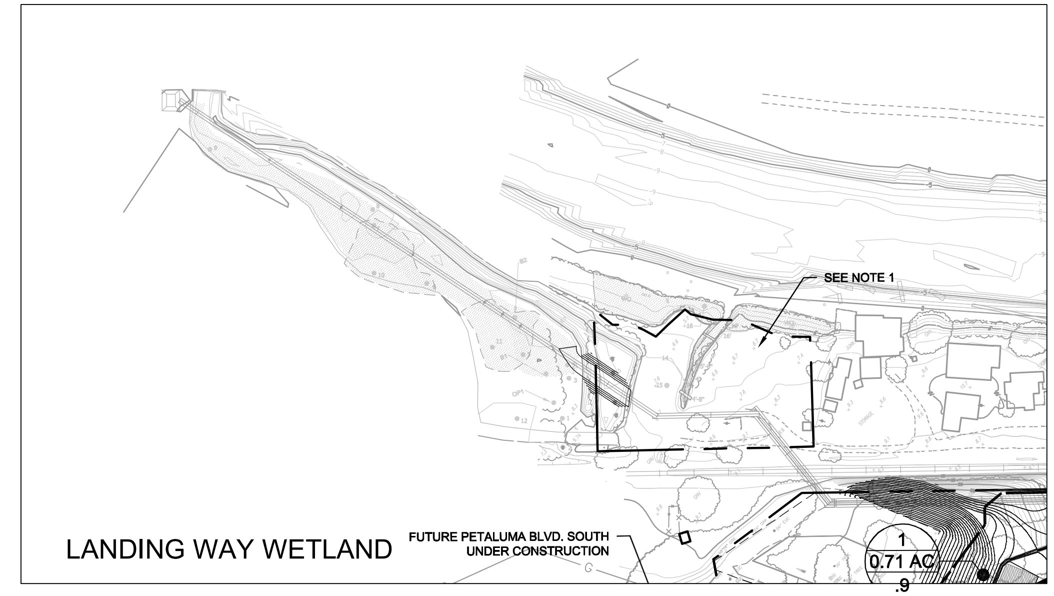
See Exhibit 40

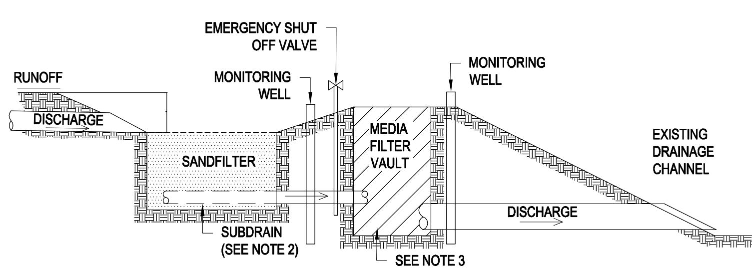
Appendix 5.2 – Stormwater Control Plan

See Exhibit 40

NOTES

1. THE EXISTING BASEROCK SHALL BE REMOVED FROM THE PARCEL AND THE EXISTING SOIL EITHER AMENDED OR NEW PLANTING MEDIUM IMPORTED SO THAT VEGETATION CAN BE RE-ESTABLISHED OVER THE ENTIRE PARCEL (EXCEPT AT THE ROAD LOCATIONS). THE APPLICANT SHALL ENSURE THAT NO NET FILL OCCURS ON THE SITE (I.E. ANY FILL IMPORTED TO THE SITE MUST BE OFFSET BY OR EQUAL OR GREATER VOLUME OF MATERIAL EXPORT OUT OF THE FLOODPLAIN).
2. AN EMERGENCY SHUTOFF SYSTEM THAT WILL ALLOW THE PLANT OPERATOR TO STOP DISCHARGE FROM THE CATCH BASIN SHOULD A CHEMICAL SPILL OCCUR AT THE FACILITY SHALL BE INCLUDED IN THE BASIN DESIGN. THE METHOD FOR ENGAGING THE SHUTTOFF SYSTEM SHALL BE SIMPLE AND ALL APPROPRIATE PLANT EMPLOYEES SHALL BE INSTRUCTED IN OPERATING THE VALVE AS A PART OF ROUTINE TRAINING.
3. AS REQUIRED BY THE GENERAL PERMIT FOR INDUSTRIAL ACTIVITIES, THE APPLICANT SHALL CONDUCT REGULAR INSPECTIONS OF THE FACILITY BMP'S AND COLLET STORM WATER RUNOFF SAMPLES DURING STORM EVENTS WHERE A DISCHARGE OCCURS. THIS DATA SHALL BE REVIEWED FOR COMPLIANCE WITH APPLICABLE PUBLISHED U.S. EPA BENCHMARK VALUES FOR STORM WATER RUNOFF. IF THE ANALYTICAL RESULTS FROM THE PUBLISHED EVENTS INDICATE THAT BENCHMARK VALUES ARE BEING EXCEEDED, CORRECTIVE ACTION SHALL BE IMPLEMENTED BY THE APPLICANT IN COORDINATION WITH RWQCB WITHIN 60 DAYS OF THE REPORT.





PROFILE VIEW
SCALE: NTS

NOTES

1. SAND FILTER SIZED TO TREAT 100-YR STORM VOLUME
2. SAND FILTER SUBDRAIN ORIFICES SIZED TO RESTRICT FLOW TO LESS THEN 10-YR STORM FLOW RATE. THE 10-YR STORM VOLUME IS TREATED AND RELEASED, JUST AT A LOWER FLOW RATE
3. IF WATER SAMPLES ARE NOT VISIBLY CLEAR, INSTALL MEDIA FILTER CARTRIDGES IN VAULT TO FURTHER TREAT STORMWATER.

HYDROLOGY CALCULATIONS

DRAINAGE SUB SHED NUMBER	DRAINAGE SUB AREA	C-VALUE	TC (MIN)	i10 (IN/HR)	i100 (IN/HR)	Q10 (CFS)	Q100 (CFS)	V10(CF) NOTE 1	V100(CF) NOTE 1
1	0.71	0.90	7.0	2.54	3.63	1.35	1.93	853.10	1215.89
2	1.46	0.90	15.0	1.70	2.42	1.86	2.64	2509.05	3567.90
3	1.41	0.90	15.0	1.70	2.42	1.80	2.56	2433.48	3460.44
4	2.16	0.90	15.0	1.70	2.42	2.76	3.93	3728.65	5302.21
5	3.24	0.70	15.0	1.70	2.42	3.22	4.58	4347.22	6181.81

10 YEAR, 24 HOUR	FT	VOLUME (CF)
4.5	0.375	11583
4.5	0.375	23768
4.5	0.375	23052
4.5	0.375	35322

Q=CiAK

WHERE:
Q=DISCHARGE, CFS
C=RUNOFF COEFFICIENT
i=RAINFALL INTENSITY
A=TRIBUTARY AREA
K=K-FACTOR (0.833)

$$i_{10} = \frac{7.08}{T_C^{\ 0.526}} \qquad i_{100} = \frac{10.15}{T_C^{\ 0.529}}$$

WHERE:
IX=RAINFALL INTENSITY (IN/HR)
TC=TIME OF CONCENTRATION (MIN)

HYDROLOGY CALCULATIONS

DISCHARGE POINT	SUB-SHED NUMBER	WATER QUALITY VOLUME (CF)	SAND DEPTH, D (FT)	PERMEABILITY, K (FT/DAYS)	TIME, T (DAYS)	AVG. WATER HEIGHT, H (FT)	FILTER BED AREA, AF (SF)	ACTUAL AF (SF)	GRAVEL LAYER STORAGE (CF)	SAND LAYER STORAGE (CF)	APPROX. STORAGE REQ.	ACTUAL STORAGE (CF)	DISCHARGE RATE (CFS)	MIN. NO. CARTRIGES
A	1	1215.9	1.5	3.5	1.67	0.5	156.0	185.0	37.0	27.8	788.3	526	0.055	2.1
B	2	3567.9	1.5	3.5	1.67	0.5	457.8	475.5	95.1	71.3	2342.6	2682	0.055	2.1
C	3	3460.4	1.5	3.5	1.67	0.5	444.0	422.5	84.5	63.4	2285.6	6532	0.055	2.1
D	4	5302.2	1.5	3.5	1.67	0.5	680.4	753.0	150.6	113.0	3465.1	3918	0.055	2.1
E	5	6181.8	1.5	3.5	1.67	0.5	793.2	812.00						

FILTER BED AREA, AF: CALCULATED MINIMUM AREA OF FILTER
ACTUAL AF: PLAN VIEW SIZE OF JUST FILTER AREA

AREA 3+4=1124.4

$$Af = \frac{WQV * d}{(kT(h+d))}$$

WHERE:
AF=AREA OF FILTER BED (FT^2)
WQV=WATER QUALITY (CF)
D=DEPTH OF FILTER BED (FT)
K=COEFFICIENT O FPERMIABILITY (3.5 FT/DAY)
T=TIME FOR WQV TO FILTER THROUGH SYSTEM (1.67 DAYS)
H=AVERAGE WATER HEIGHT (FT)

NOTES
1. VOLUMES DETERMINED USING A 1 TO 2 LEAD TO LAG HYDROGRAPH

$$C = \frac{R(CFS)}{12GPM/(448.8GPM/CFS)}$$

WHERE:
C=MINIMUM NUMBER OF CARTRIDGES
R=DISCHARGE RATE

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DUTRA HAYSTACK LANDING AND PORTION OF LANDING WAY
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
DUTRA GROUP

City Of

County Of
Sonoma

State Of
California

Prepared Under the Direction of:

Sheet
EXH-40

Scale: 1" = 100'
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