APPENDIX J-1

Stormwater Control Plan for 780 and 790 Derr Street

STORM WATER CONTROL PLAN
FOR
780 & 790 DERR STREET
VALLEJO, CA

Prepared for Compliance with C.3 Storm Water requirements in accordance with the Municipal Regional Stormwater Permit NPDES No, **CAS612008** dated October 14, 2009.

March 27, 2014

Prepared for:

Vallejo Marine Terminal
4171 Canyon Road
Lafayette, CA 94549

By:

Meridian Associates, Inc.
1470 Civic Court Suite 360
Concord, CA 94520

Job No. 13-05-01

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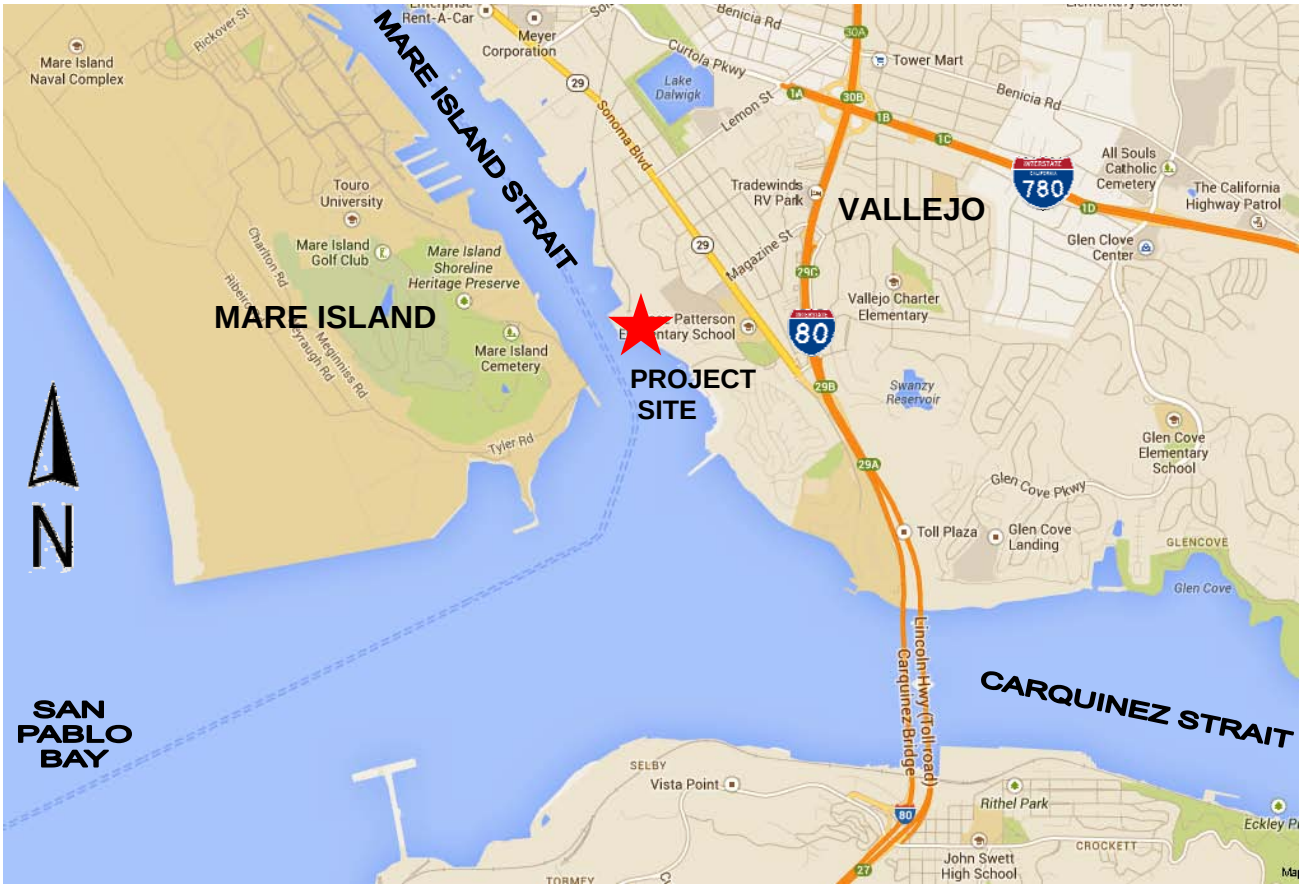
SECTION 1.0 PROJECT SETTING

1.1 Project Location and Description

The Vallejo Marine Terminal is a proposed production plant facility located at 780 & 790 Derr Street in the City of Vallejo. The site is separated by an access road into two distinct areas: 1) The operations facility (northeast of the road) and 2) the dock/laydown area, which includes the access road and the areas southwest of the road. The SWCP for the operations facility is a separate document. This SWCP addresses the dock/laydown area, which along with the engineered fill to be placed for the docks, comprises approximately 9.7 acres. A vicinity map and site map are shown below.



VICINITY MAP – VALLEJO MARINE TERMINAL, VALLEJO, CA
NOT TO SCALE

SITE MAP – VALLEJO MARINE TERMINAL, VALLEJO, CA
NOT TO SCALE Photo Date: 9-1-2012

1.2 Existing Site Features and Conditions

The site is the former General Mills plant fronting the Mare Island Strait at the end of Derr Street, and is bounded by undeveloped, vegetated slopes. To the northeast (beyond the slope) are residential homes and a school. Site topography ranges from elevation 117 at the top of the slope

near the school, to elevation 18 at the northeast limit of the Operations area. From there the ground slopes southeasterly to the Strait at elevation 11, with surface slopes ranging from 1% to 7%. At the Strait's edge, the ground slopes from 10% to 60% to the water surface at elevation 4.2± (low tide).

The site has undergone some building, pavement and rail removals. Surface vegetation (in gravelly areas) consists of a moderate growth of grasses and weeds. Paved access roads and parking areas exist on the site in varying degrees of thickness and disrepair. There are some pervious landscape areas and trees on the site. The existing land area of the dock/laydown area is approximately 8.8 acres. Engineered fill for Phase 1 and Phase 2 docks will add approximately 2.1 acres to the dock/laydown area, for a total site surface area of 10.9 acres.

For calculation purposes, existing and proposed gravel areas are considered as 60% impervious. Site impermeability was calculated as follows:

Parameter	Impervious Factor	Pre-Development Condition	Post-Development Condition
Area		8.8 acres	10.9 acres
Impervious (Buildings and roads)	0.9	35% (3.1 ac)	25% (2.7 ac)
Semi-Pervious (Gravel & dock areas)	0.6	50% (4.4 ac)	60% (6.6 ac)
Landscape (Bio-basin and swales)	0.1	15% (1.3 ac)	15% (1.6 ac)
Weighted Impermeability Factor		0.63	0.60

1.3 Pre- & Post-Development Peak Runoff Rates

Peak runoff from the site will be reduced by a combination of three factors: 1) The existing site impervious area will be reduced from 3.1 acres to 2.7 acres, including the removal of the existing warehouse building at the site entry; 2) An increase in site landscape area (including swales and the bio-basin) from 1.3 acres to 1.6 acres; and 3) a decrease in the weighted site impermeability factor from 0.63 to 0.60. A 10-year storm event is expected to produce runoff of 8.2 cfs at its peak. The bio-basin has been sized for a capacity of 13.0 cfs (without consideration for infiltration). In the pre-development condition, sheet runoff flows directly to the banks of the Mare Island Strait. In the post-development condition, all on-site runoff is directed to the vegetated swales, storm drain system, and bio-basin for detention and filtration.

1.4 Storm Water Conveyance Systems

A series of coordinated Best Management Practices (BMPs) will be used to remove pollutants, slow runoff, and contain runoff prior to its release into the Mare Island Strait.

Storm Water control design is focused on filtering of runoff as it flows across the site. Runoff from roofs and paved areas is directed to the storm drain system, or to a vegetated swales prior to entering the storm drain system. The downstream end of the storm drain system flows into the bio-basin for retention and filtration before discharging to the Mare Island Strait. In addition, there will be areas of landscaping and or vegetation where site operations are not subject to truck traffic. Since the layout of operations (truck routes, stockpiles, conveyor systems) will change from time to time, these areas are not deducted from the required treatment area of the site.

The bio-basin has several overflow inlets in the event of a severe storm. The overflow inlets allow ponded runoff to enter the subdrain system instead of overflowing the banks of the basin. In less severe storms, the basin will drain through infiltration into the subdrain system at a rate no less than 5” per hour. It is expected that the basin will drain completely within 48 hours of the end of any storm event.

1.5 Opportunities and Constraints for Storm Water Control

The main constraints for Storm Water controls include relatively shallow groundwater and the flexibility required for unloading, trucking, stockpiling, and storage of materials. In addition, the moderately expansive soils somewhat prohibits the use of permeable pavements on highly traveled roadways, such as the main entrance roads and expected routes for truck traffic.

The main opportunities for Storm Water controls are the site topography and site layout, which includes proposed vegetated swales, a storm drain system, and a bio-basin. The fairly flat laydown area lends itself to effective control of runoff in vegetated swales or as sheet flow, directed to the storm drain system and the bio-basin for retention and filtration.

Phase 1 site development will include the construction of a new pier, adding approximately 26,000 square feet of surface area, placed as fill along the bank of the Mare Island Strait. The Phase 2 dock will add approximately 91,000 square feet of surface area, also as fill in the Mare Island Strait. The finished grade at both docks will be designed to carry runoff away from the Strait for collection and filtration instead of directly discharging into the Strait. In this way,

debris and pollutants from unloading and/or vehicle operations can be adequately filtered prior to discharge. Minor landscape areas not affected by stockpiling or truck traffic also present an opportunity for storm runoff filtration.

Access to the site is gated at the main entry from Derr Avenue. Since the site is private, the access roads can be designed with a straight cross- slope (rather than crowned), which will direct runoff to the storm drain system, and in some cases, vegetated swales at the road edge. All road runoff is directed to the bio-basin for filtration prior to draining into the Mare Island Strait.

SECTION 2.0 MEASURES TO LIMIT IMPERVIOUSNESS

2.1 Measures to Reduce Development and Minimize Impervious Area

The site was previously a manufacturing plant. Existing vegetation consists of a moderate growth of grasses and weeds. There are no streams or other significant hydrological features on the site. All adjacent properties are separated from the site by fences and/or existing topographical features. The Operations Area SWCP is a separate document; this SWCP is concerned with the Laydown Areas as shown on Figure and described in Section 1.1

The project is a redevelopment of the existing manufacturing plant. The following layout characteristics have been selected to reduce impervious areas:

- The existing warehouse building at the site entry will be removed. The area will be paved or topped with gravel and used for truck/rail traffic and for stockpile of materials and/or equipment.
- A bio-basin and vegetated swales will be added to the site to increase the landscape (pervious) areas. Vegetated swales will be installed where possible, avoiding areas of heavy truck traffic and/or stockpiled materials.
- Existing trees and landscape areas are to be preserved where possible.

2.2 Measures to Limit Directly Connected Impervious Area

2.2.1 Selection of Paving Materials

Conventional concrete and asphaltic concrete are used throughout the site where truck traffic and/or loading and unloading of rail traffic occur. Stockpile areas are expected to be overlain

with gravel of sufficient thickness to support truck/equipment loads. Over time, vegetation may grow on the unused portions of the gravel, while heavily travelled areas may need a top dressing of additional gravel.

2.2.2 Self-Treating Areas, Drainage Design, and Bio-Basin

Self-treating areas on the site will consist of small landscaped areas where runoff may infiltrate, and gravel areas not subject to truck traffic where vegetation has sprouted and will allow some infiltration to the subgrade. For calculation purpose, these areas are not included in the required sizing of the bio-basin, other than to treat gravel with an permeability factor of 0.6. Vegetated strips, where installed, are expected to trap pollutants from roadways, and discharge into the storm drain system for conveyance to the bio-basin. A typical vegetated swale is shown in Appendix A, Figure B. A total of 3,700 square feet of vegetated swale is shown on the Storm Water Control Plan, however, site conditions may require elimination or relocation of some swales due to truck/equipment traffic and or operational procedures. In any event, the total area of vegetated swales on site should never be less than 2,200 square feet, to maintain a total swale and bio-basin minimum total of 19,000 square feet.

All site runoff is directed to the bio-basin, which filters runoff (through infiltration) before discharge to the Mare Island Strait. The storm drain system discharges to the surface of the bio-basin for both treatment and flow control purposes. A bio-retention basin cross section is shown in Appendix A, Figure B.

SECTION 3.0 SELECTION AND PRELIMINARY DESIGN OF STORM WATER TREATMENT BEST MANAGEMENT PRACTICES (BMPS)

The project BMPs and tributary areas are shown on the Storm Water Control Plan (Appendix A, Figure A).

As discussed in previous sections, storm water treatment is provided in three primary ways:

1) Paved area runoff is directed to vegetated swales and/or the storm drain system.
2) Gravel/Stockpile area runoff has minor infiltration, and the remainder is directed to the storm drain system or to the bio-basin.
3) All site runoff enters the bio-basin for retention and infiltration prior to discharging to the Mare Island Strait.

As mentioned in section 2.2.2, minor self-treating and landscape areas are ignored for calculation purposes.

3.1 Location, Details and Maintenance of IMP's

The primary IMP treatments are vegetated swales and the bio-basin, which are designed to collect and treat site runoff prior to discharge. IMP design details and locations are described below and shown on the Storm Water Control Plan (Appendix A, Figure A). Project BMPs are as follows:

No.	BMP	Location/Comments	Appendix A
1)	Vegetated Swales	Edges of roadway and at top of slopes as needed to prevent runoff over the slope.	Figure C
2)	Bio-Basin	North end of site. All site runoff is directed to the basin for retention and filtration.	Figure B

3.1.1 Vegetated Swales

Vegetated swales are a minimum of 5' wide, and consist of grasses, groundcovers, and other plants, and may incorporate landscape materials such as river-rock, and decorative borders. Installation and location of the swales is subject to removal and relocation based on site operations. Together with the bio-basin, the total surface area for swales and the basin should never be less than 19,000 square feet. With a basin size of 16,800 as shown on the Storm Water Control Plan, this would require a minimum of 440 lineal feet of vegetated swale. The SWCP as shown has 740 lineal feet. Vegetated swales shall be maintained to provide effective filtering of runoff. "Effective filtering" means that the vegetated strips are not modified or neglected such that the vegetated area is decreased by more than 15%. Maintenance will consist of replanting, trimming, and debris removal, and may require repairs to the irrigation system, if any.

3.1.2 Bio- Basin

The bio-basin is a soil and plant-based filtration and retention area that removes pollutants. The bio-retention basin consists of a vegetated surface, sandy loam soil mix, ponding area, organic layer, mulch layer, storage layer, and subdrain system. The runoff velocity is reduced by being distributed evenly across the pond area and interacting with the soil medium, vegetation, and soil microbes, as it passes through to the storage layer. Exfiltration of the stored water from the storage layer into the subdrain system occurs over a period of days (after significant storm events). The special soil layer is underlain with a 12" layer of gravel storage. The gravel storage

system is designed to collect the filtered runoff prior to discharge into the subdrain system, and is comprised of ¾-inch diameter crushed rock with a geotextile filter fabric (Mirafi 140N, or equivalent) to separate it from the sandy loam soil above. A 6-inch diameter perforated subdrain pipe runs along the bottom of the gravel storage layer to convey water to the discharge point. A bio-basin detail is in Appendix A, Figure B.

3.2 Sizing Calculations

Treatments and filtration IMP's have been incorporated into site design to the maximum extent practicable given the site constraints previously discussed.

The vegetated swales and bio-basin were sized in order to meet the C.3 requirements. As described in the previous section, small self treating and landscaped areas are not considered as a credit against the required minimum area of the vegetated swales and bio-basin.

Vegetated swale areas are located to "pre-treat" roadway runoff prior to entering the storm drain system and discharging to the bio-basin. Since all run-off from the site enters the bio-basin, the vegetated swale areas, in combination with the bio-basin, was sized to meet the requirements of the Regional Water Quality Control Board C.3 guidelines. For this site, the required treatment area is 4% of the site's impervious area. For calculation purposes, no distinction was made between paved areas, gravel areas and landscape areas in terms of their impervious qualities (permeability factors). Thus, a site of 10.9 acres requires 19,000 square feet of treatment area. The bio-basin is shown on the SWCP (Appendix A, Figure A) as 16,800 square feet, and the vegetated swales are shown as 3,700 square feet, for a total of 20,500 square feet, or 22% more than the minimum required treatment area.

Flow control requirements were not considered, as the site achieves a reduction in impervious area percentage, and an increase in landscape area percentage (see section 1.1). In addition, the retention component of the bio-basin will reduce runoff from the site compared to its existing level. Furthermore, the site drains directly into the Mare Island Strait, so there will be no increase in the runoff to an off-site storm drain system.

3.3 Additional Low Impact Development (LID) Measures

In accordance with section C.3.c of Order R2-2009-0074, the project incorporates (at a minimum) the following additional LID measures:

● Tree planting	Applicable to any tree planting on site
● Landscaping Soil Quality	Applicable to landscape areas
● Landscaping that minimizes irrigation and runoff	Applicable to any new or refurbished irrigation
● Efficient irrigation systems	Applicable to any new or refurbished irrigation
● Storm drain inlet stenciling	"No Dumping – Drains to Bay"

SECTION 4.0 SOURCE CONTROL MEASURES

4.1 Description of Site Activities and Potential Sources of Pollutants

The project is designated for manufacturing. Potential sources of pollutants may be present in day-to-day manufacturing procedures, such as loading and unloading of materials, stockpiles, landscaping, vehicle and equipment maintenance, and other pollutant sources. In general, any potential pollutants likely to be present will be treated by a combination of the vegetated swales and the bio-basin as described in the previous section. Table 4-1 below summarizes the potential pollutant sources and controls. All areas where these activities occur will drain to treatment BMP's. To further reduce the potential for pollutants to discharge into the public storm drain system, permanent and operational BMP's will be implemented as described in Table 4-1.

TABLE 4-1 POTENTIAL POLLUTANT SOURCES AND CONTROLS

Potential Source of Pollutant Runoff	Permanent BMP'S	Operational BMP's
On-Site Storm Drain Inlets	Storm drain inlets will be marked with the words "No Dumping! Drains to Bay"	1) Inlet markings will be periodically maintained. 2) Storm Water pollution prevention information will be provided to site personnel.
Need for Future Indoor & Structural Pest Control	General building practices will be designed to minimize the potential for pest intrusion	Integrated pest management information will be provided to site personnel.

Landscaping/Outdoor Pesticide Use	Landscaping will be designed in order to minimize irrigation and runoff requirements	Water pollution prevention information, including pesticide and fertilizer use will be provided to site personnel.
Rooftops	Runoff from rooftops may discharge onto paved areas or storage areas before entering the storm drain system. Runoff may flow through a vegetated swale prior to discharge into the storm drain system	Maintenance of vegetated swales will be performed regularly in order to ensure proper functionality

SECTION 5.0 SUMMARY OF PERMITTING AND CODE COMPLIANCE ISSUES

The Storm Water control BMP's, as described in this report, should not conflict with RWQCB codes or other agency requirements. All Storm Water controls were designed in accordance with manufacturer's recommendations, RWQCB guidelines, California Storm Water Quality Association (CASQA) standards, and applicable City of Vallejo standard drawings. Should any conflicts arise; the issue will be resolved through the development review process or during subsequent permitting.

SECTION 6.0 BMP MAINTENANCE REQUIREMENTS

Upon completion of construction activities, BMP maintenance will be transferred to the site owner. In general, maintenance of all BMPs are the responsibility of the owner, along with the right to maintain or repair any BMP essential to the function of the pollutant and sediment removal system, such as vegetated swales, private drains, and the bio-basin. The City of Vallejo reserves the right to inspect, maintain and repair (or request repair) of any items deemed deficient.

6.1 Ownership and Responsibility for Maintenance in Perpetuity

6.1.1 Commitment to Execute and Necessary Agreements

The Owner, or his designee, will provide any necessary easements or rights of entry to the City of Vallejo, or other agencies as required, for access and inspection of Storm Water BMP's and to make provision of easements or rights of entry a condition of sale.

6.1.2 Statement Accepting Responsibility for Operation and Maintenance of BMP's until that Responsibility is Formally Transferred.

The Owner agrees to maintain the BMP facilities installed in connection with the project until one of the following occurs:

1) Acceptance of maintenance responsibility by another party or agency, including the filing of all required easements and establishments of a special district or other permanent funding mechanism; or
2) Transfer of responsibility to another party or agency which will be responsible for maintenance, execution of Codes, Covenants, and Responsibilities or other agreements that run with the land and will require any future owner(s) to provide and pay for maintenance of Storm Water BMPs and execution of a Storm Water Management Facilities Operation and Maintenance Agreement and Right of Entry in the form provided by the City of Vallejo or other agency.

6.1.3 Storm Water Facilities Operation and Maintenance Plan

The Owner will submit, with the application for building or site permits, a draft Storm Water Facilities Operation and Maintenance Plan including detailed maintenance requirements and a maintenance schedule.

6.2 Summary of Maintenance Requirements for Each BMP

The main Storm Water controls are incorporated into the Storm Water drainage and conveyance system, particularly the vegetated swales, and the underground portion of the storm drain system.

6.2.1 Vegetated Swales

Operation and maintenance of vegetated swales will be the responsibility of the Owner. The typical routine maintenance for the IMP's will involve the following activities:

- Inspect IMPs for erosion and exposure of soils. Remove any accumulated sediment and repair exposed areas;
- Periodically inspect subdrain pipes and discharge pipes beneath the IMPs for evidence of sediment accumulation or other flow obstructions. Remove any accumulated sediment or flow obstructions;
- Observe soil at the bottom of the IMPs for uniform percolation. If areas are not percolating within 48 hours after a storm, the soil should be tilled and replanted or replaced;
- Vegetation should be examined periodically to ensure that it is healthy and dense enough to provide the required filtration and to prevent soil erosion. Damaged or dead plants should be replaced in kind;
- Curb drain/pipe sleeves and/or paved area undercrossings should be kept free of debris;
- Any fallen leaves or debris should be removed from the IMP. Irrigation should be performed so as not to be excessive, but to maintain healthy vegetation; and
- For vector control activities, any holes in swales or areas where water could pond for more than 48 hours should be promptly backfilled or repaired. If any mosquito larvae are present and persistent, the appropriate agency should be contacted for information and advice. The use of larvicide's and other pesticides should be kept to an absolute minimum and applied only when necessary by a licensed individual or contractor.

Bio-Basin

The bio-basin removes pollutants by detaining runoff in a quiescent pool long enough for some of the particulates to settle to the bottom. They require routine (preventive) maintenance and non-routine maintenance.

Typical *routine* maintenance consists of the following:

- Examine inlets to ensure that piping is intact and not plugged. Remove accumulated sediment or debris near the inlet.

- Examine outlets and overflow structures and remove any debris or sediment that could plug the outlets. Identify and correct any sources of sediment and debris. Check rocks or other armoring and replace as necessary.
- Inspect embankments, dikes, berms, and side slopes for signs of erosion or structural deficiencies.
- Confirm that any fences around the facility are secure.
- Control vectors by filing any holes in or around the pond and examine the pond for evidence of mosquito larvae.

Typical *non-routine* maintenance includes the following:

- Dredge accumulated sediment. This may be required every five to 15 years, and more frequently if there are excess sources of sediment. Dredging is usually a major project requiring mechanized equipment. The work will include an initial survey of depths and elevations; sediment sampling and testing; removal, transport, and disposal of accumulated sediment and reestablishment of original design grades and sections.
- Remove invasive plants. Depending on the success of the design and the rate of sedimentation, ponds may be subject to excessive growth of rooted macrophytes, which reduce the effective area of the pond and create quiescent surface water that supports mosquito larvae. Removal may require a level of effort similar to dredging.

6.2.2 General Storm Drain System Maintenance

Routine maintenance of the storm drain system will generally involve the removal of any accumulated sediments and debris. Maintenance of the storm drain system will be performed under the direction of the Owner. Treatment systems including vegetated swales are designed to minimize downstream transport of pollutants, sediments and debris. The maintenance requirements are anticipated to be low.

SECTION 7.0 CONSTRUCTION PLAN C.3 CHECKLIST

The following table describes the Storm Water control BMPs selected for the site.

TABLE 7-1 CONSTRUCTION PLAN C.3 CHECKLIST

Storm Water Control Plan Reference	BMP Description	Plan Sheet Number
Section 3.1.1	Vegetated Swales. Roof drains will discharge to a splash block and be directed to a vegetated swale or dtorm drain inlet.	Figure B Figure C
Section 3.1.2	Bio-Basin (Treatment and Flow Control): The Bio-Retention functions as a soil and plant-based filtration device that removes pollutants. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic/mulch layer, planting soil, and plants. The runoff velocity is reduced by the buffer strip and distributed evenly across the pond area. Exfiltration of the stored water into the underlying storage area occurs over a period of days.	Figure B
	On-site drain inlets will be marked with a "No Dumping! Drains to Bay" message	
	Personnel education regarding pest control, landscaping, vehicle washing, and general Storm Water pollution prevention requirements; including plant selection to minimize water, fertilizer, and pesticide requirements	
	Drainage areas and descriptions as delineated in the Storm Water Control Plan will be incorporated into the grading plans. This includes routing of runoff to swales as described in the SWCP.	

SECTION 8.0 CERTIFICATION

The selection, sizing, and preliminary design of Storm Water treatment BMPs and other control measures in this plan meet the requirements of Regional Water Quality Control Board (RWQCB) Order R2-2003-022 and subsequent amendments.

If there is a discrepancy between a requirement and detail as described herein, or in the project plans, and the requirements of other agencies or the RWQCB, the more stringent requirement shall apply, unless indicted differently in writing by the affected regulatory agency. The Owner, or its representative, may propose alternate and/or additional BMP for use on this site, subject to the review and approval of the RWQCB, or other appropriate agency.

OWNERS CERTIFICATION

I, the undersigned, certify that all land clearing, construction and development shall be done pursuant to the approved plan.

_____

STORM WATER CONTROL PLAN (SWCP)
VALLEJO MARINE TERMINAL, VALLEJO, CA

Figure B – TYPICAL LOT DRAINAGE

Figure A – STORMWATER CONTROL PLAN

Figure C – Bubble-Up & Vegetated Filter Strip Detail

(SEE NOTE 1)

Figure E – Bio-Retention Detail for IMP
Figure D – Bio-Swale Detail for IMP

ROADWAY AND RAILROAD RESERVE

LIMIT OF STORM WATER PLAN (NORTH SIDE OF ROAD - TYPICAL)
(FOR LEASE AREA STORM WATER MANAGEMENT SEE SEPARATE PLAN)

EARTH SWALE (TYPICAL)

SHEET FLOW DIRECTION
(TYPICAL)

ROADWAY & RAILROAD (RESERVE)
DRAINS TO EARTH SWALE (TYPICAL)

EXISTING BUILDING TO REMAIN

OPERATIONS AREA
(NOT A PART OF THIS SWCP)

ELEVATOR

OUTLOAD SILOSS
& WEIGHBRIDGE

ROADWAY & RAILROAD (RESERVE)
DRAINS TO EARTH SWALE (TYPICAL)

ROADWAY AND
RAILROAD RESERVE

LIMIT OF DRAINAGE
AREA

FILL TO ELEVATION 8.1±

FILL TO ELEVATION 8.1±

LIMIT OF DRAINAGE
AREA

GRASSY SWALE
(FILTRATION SWALE)
SEE DETAIL BELOW

PORT ROAD &
RAIL RESERVE

OUTFALL FOR ON-SITE (LEASE AREA)
DRAINAGE (SEE PLANS BY KPFF
CONSULTING ENGINEERS)

ENGINEERED FILL

LIMIT OF DRAINAGE
AREA

EARTH SWALE (TYPICAL)

PHASE TWO DOCK

LAYDOWN AREA

PHASE TWO
CONVEYOR SYSTEM
(APPROX)

FILL TO ELEVATION 8.1±

40 20 0 40 80 120
SCALE IN FEET

PHASE ONE TRUCK
TRAFFIC ROUTE
(APPROX)

FILL TO ELEVATION 8.1±

EARTH SWALE (TYPICAL)

LAY DOWN & DOCK AREA
OUTFALL ELEV 5.0±

PHASE ONE DOCK

14' WIDE GRASSY SWALE (INFILTRATION SWALE)

GRASSES, LANDSCAPE PLANTINGS
AND/OR HARDWOOD MULCH AT
DRAIN AREA

6" ATRIUM GRATE (3 EQ. SPACED)
NDS MODEL 80, OR EQUAL

2'±

EXISTING
GROUND

6" NON-PERFORATED
RISER

10" PONDING
TYPICAL

10%

3

1

NATIVE SOIL

18" SANDY LOAM
MIN. INFILTRATION RATE 5"/HR.

12" PVC PIPE S=1% MIN

18" x 12" 1/4" CLASS II PERMEABLE DRAIN ROCK

OUTFALL TO MARE ISLAND STRAIT
AT MIDPOINT OF SWALE±

6" PERFORATED SUBDRAIN (ALONG SWALE) CONNECT
WITH RISER & OUTLET PIPE USING FITTINGS

REDUCER OR TEE FITTING WITH
APPROPRIATE SIZED CONNECTIONS.

GRASSY SWALE DETAILS
NOT TO SCALE

NOTES:

1. THIS STORM WATER MANAGEMENT PLAN IS BASED ON PRELIMINARY SITE STUDIES AND IS SUBJECT TO CHANGE.

2. RUNOFF MANAGEMENT FOR AREAS EAST OF THE PROPOSED ROADWAY/RAILROAD RESERVE ARE PART OF A SEPARATE STORM WATER MANAGEMENT PLAN.

3. ALL SURFACE RUNOFF ON THE SITE (ROADWAY/RAILROAD RESERVE, EXISTING BUILDING, LAYDOWN AREA AND ENGINEERED FILL AREAS) SHALL BE DIRECTED TO EARTH SWALES, AND CONTINUE IN THE SWALE TO THE GRASSY SWALE FOR FILTRATION BEFORE RELEASE INTO THE MARE ISLAND STRAIT.

4. THE LAYDOWN AREA WAS CLEARED OF BUILDINGS, PARKING AREAS AND RAILROAD TRACKS AND WILL BE COVERED WITH AGGREGATE BASE TO REDUCE DUST AND SUPPORT TRUCK AND EQUIPMENT TRAFFIC.

5. THE EARTH SWALE MAY BE LINED WITH AGREGGATE BASE, RIP-RAP OR HYDROSEEDING TO REDUCE THE POTENTIAL FOR SCOURING.

6. THE THICKNESS OF THE FILTRATION MEDIA (SHOWN AS 18") MAY BE REVISED TO ACCOMODATE THE REQUIRED INFILTRATION RATE OF 5"/HOUR

7. THE SITE DRAINAGE AREA IS APPROXIMATELY 9.7 ACRES. A 10-YEAR STORM PRODUCES APPROXIMATELY 7.3 CFS OF RUNOFF AT ITS PEAK. THE GRASSY SWALE AS SHOWN HAS THE CAPACITY FOR 15.6 CFS WITH THE FOLLOWING DIMENSIONS: LENGTH: 260' TOP WIDTH: 14'
DEPTH: 12" BOTTOM WIDTH: 8'
SIDE SLOPES: 3:1 MINIMUM LONGITUDINAL SLOPE: 1%

M:\Jobs\13-05-01\SWMP 8-12-2013.dwg

DATE: AUG 28, 2013				
SCALE: 1" = 40'				
DRAWN: T.J.B.				
DESIGNED: T.J.B./H.K.				
ENGINEER: J.R.				
MANAGER: H.K.	NO.	BY	DATE	REVISIONS

PREPARED BY, OR UNDER
THE DIRECTION OF:

BY: JOHN RZONCA C38710
EXP 3/31/2015

MERIDIAN ASSOCIATES, INC.
CIVIL ENGINEERING • PLANNING • SURVEYING
1470 ENEA CIRCLE SUITE 1750
CONCORD, CA 94520
PHONE: 925-691-7300
FAX: 925-691-7110

OWNER:
VALLEJO MARINE TERMINAL, LLC
4171 CANYON ROAD
LAFAYETTE, CA 94549
510-261-2400

VALLEJO MARINE TERMINAL

PRELIMINARY STORM WATER MANAGEMENT PLAN

VALLEJO SOLANO COUNTY CALIFORNIA

SHEET
SW-1
OF 1 SHEETS

JOB NO.
13-05-01