PRELIMINARY SITE SELECTION

Initial Site Reconnaissance should be very liberal regarding potential area for IFB. Only areas with obvious space limitations regarding setback criteria should be eliminated from potential IFB candidacy. Sites that easily meet or would require measurement to verify setback criteria should be considered as candidates for IFB locations

Initial Site Reconnaissance
- Identify potential space for IFB within Caltrans right-of-way
- Identify undeveloped land outside Caltrans right-of-way
  - Review current aerial photographs
  - Conduct "drive-by" reconnaissance
- Complete preliminary characterization of corridor if potential IFB areas are identified

No areas identified → Still complete preliminary characterization of corridor for use in future studies and consideration of other BMP's

Areas identified

Characterize Soil and Groundwater Conditions
- **Soil Conditions**
  - Conduct literature review to establish baseline characterization of soils and groundwater conditions independently of other preliminary criteria
  - Establish NRCS soil types and infiltration/permeability properties from soil tables
  - Consider only Hydrologic Group A and B Soils
  - Establish USCS soils from previous borings (if available)
  - Reference geology maps
  - Evaluate presence of fill material (from previous borings, maps, comparison of present and past topography).Exclude sites located on fill, unless fill contains no silt or clay
- **Groundwater Conditions**
  - Tabulate depth to historically highest groundwater
  - Tabulate depth to groundwater from previous investigations (if available)
  - Tabulate depth of regional groundwater from production wells and other known sources. Construct hydrographs for past 20 years

Consider Hydrologic Group C Soils only if geologic mapped units or information from previous investigations indicate positive soil properties for infiltration

Conduct field reconnaissance for identified sites

Minimum surface area is based on estimate of WQV available to basin using 0.5 in./hr. infiltration rate, 0.1 ac.-ft. catchment volume, and 48 hr. drawdown time according to Equation 1 in Exhibit A (A=)V/kt

Field Reconnaissance
- Site reconnaissance of potential IFB areas
  - Confirm soil types/geology identified from literature review
  - Establish surface area based on setback criterion, including slope criteria and space for maintenance access. (refer to Exhibit A for setback criteria)
  - Record setback dimensions

If area is <2,150 ft^2 → Document eliminating condition, and consider other BMP's

If area is >2,150 ft^2 continue with Preliminary Site Screening

Refer to soil, groundwater-invert separation distances, and setback criteria listed in Exhibit A. Consider time and effort to evaluate environmental conditions

Rate reaches or site areas for potential IFB locations and rank potential sites according to criteria.
- Identify conditions that could eliminate a site from further consideration as IFB
- Identify actions needed to confirm or disprove condition
- Rank sites according to ease that condition can be established
- Document conditions in easily reviewable format
- Perform additional preliminary site screening based on site ranking

Typically sites would only be ranked and not eliminated at this stage of the preliminary site selection process. Elimination of potential sites should occur when recognized conditions are substantiated during additional preliminary site selection or secondary investigations. However, potential sites could be eliminated when:
- Active groundwater monitoring well records collected from monitoring wells located at the site indicate unfavorable groundwater elevations
- Soil and/or groundwater contamination has been identified during the site characterization and substantiated by regulating agencies
- Poor soil conditions have been recognized from previous soil boring investigations with soil types confirmed with geotechnical particle size analysis. The number of soil borings must be adequate to fully characterize site for infiltration purposes

Eliminating condition not identified Complete preliminary site selection

Continue Preliminary Site Selection Process

Additional Preliminary Site Screening
- Locate and record location of drainage structures, and surface drainage patterns
- Search for utilities, signs of environmental remediation at site vicinity, active and inactive wells
- Base flow should not be present in watershed
- Photograph and make field sketches of site

If site is still considered potential IFB location then:
- Complete literature search for water wells
  - Check US Geological Survey, Regional Water Quality Control Boards, and other known databases for region of study, such as the Department of Water and Power, Water Replenishment Districts, local government Public Works and Engineering Departments

If site is still considered potential IFB location then:
- Establish water quality volume, catchment areas, according to procedures and equations listed in Exhibit A
- Establish major and minor drainage modification required for capturing stormwater from available catchment areas
- Re-evaluate and document setback and slope criterion, can potential IFB be re-sized. Proposed modifications to setback criteria to be considered in preliminary design if appropriate
- Consult with RWQCB
- ISA report(s)

Consider Partial Secondary Investigation
- Purpose of partial secondary investigation is to identify suspect condition that would eliminate site, and/or to install monitoring well prior to end of wet season
  - Advance soil boring(s)
  - Install groundwater monitoring well

Eliminating condition identified and substantiated

Failed criteria → Document eliminating condition, and consider other BMP's

Eliminating conditions not identified Complete preliminary site selection

Site requiring setback modifcations → Conditionally recommended for secondary site screening. Proposed setback modifications require structural and safety evaluations to be completed by design engineers prior to site being recommended as IFB

Sites meet criteria → Recommend sites for complete secondary site screening

SECONDARY SITE SELECTION

Subsurface Soil Characterization
- **Field investigation and interpretation**
  - Define Stratigraphy – layered or massive soils by continuous sampling, coring, or direct push drilling methods
  - Generate detailed logs of borings
  - Confirm visual classifications of soil types with particle-size analyses
  - Test soil for organic content, pH, and cation exchange capacity. Values that promote pollutant capture are >5%, 6-8, and >5meq/100 g of soil, respectively
  - Generate geologic cross-sections, include all soil test results and groundwater elevation information
  - Soils should not have more than with >30% clay (includes USCS soil types CL, CH, and some SC and GC), or 40% silt and clay (ML, MH, and some SM and GM, plus the clayey soils listed above)
  - Identify thickness, depth, lateral and vertical distribution of restrictive and pervious soil layers
  - Document any surface restrictive layer, including thickness and aerial distribution of layer
  - Evaluate feasibility of excavating surface restrictive layers
- **Environmental Pre-Screening of Soils**
  - Collect and analyze soils, include analysis Title 22 metals, Total Petroleum Hydrocarbons, Volatile Organic Compounds, and other constituents based on findings from ISA reports and consultation with RWQCB for analysis

Groundwater Characterization
- **Install groundwater-monitoring wells**
  - Purpose of wells is to establish that seasonal high groundwater, including perched groundwater, has a minimum separation distance of 10 feet (3 meters) below proposed invert. Wells do not necessarily need to reach actual groundwater depths
  - Wells should be installed a minimum of 30 feet (9 meters) below proposed invert
  - Record groundwater levels observed at time of drilling, measured at least 24 hours after drilling is completed, and through the end of the wet season
- **Groundwater – Invert Separation**
  - Establish groundwater –basin invert separation distance. If groundwater is:
  - > 3 meters (10 Feet)-Detailed monitoring not required
  - < 1.2 meters (4 feet), then eliminate site
  - Between 1.2 to 3 meters (4 to 10 feet) consult with RWQCB
  - Consider other factors that could influence groundwater levels, such as local or regional recharge projects, future urbanization, or agriculture
  - Establish if annual rainfall over period of investigation is within 20 percent of a normal rainfall year
  - If rainfall is below 20 percent of normal year, and there is not a reliable indication that groundwater is greater than 10 feet (3 meters) below invert, then more detailed monitoring is required
- **Detailed Groundwater Monitoring**
  - Install at least two monitoring wells, observe groundwater levels over a wet and dry season
  - If rainfall is below 20 percent of normal year, then monitor for an additional year

Task could be completed at later date, but additional mobilization and drilling costs would be incurred if not completed during secondary subsurface soil characterization

Recommend sites that meet secondary soil and groundwater criteria for detailed investigations

Failed soil and/or groundwater criteria → Consider other BMP's

DETAILED INVESTIGATION

Consider installing in-hole hydraulic conductivity test holes during secondary field invetigation

Characterize infiltration potential of site by conducting hydraulic conductivity tests
- Use the USBR-7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered in the well) to characterize lateral and vertical hydraulic conductivity's of soil. Other documented procedures, such as double – ring tests could be used to test surface soils
- A minimum of three in-hole hydraulic conductivity tests should be performed at each site
- Design in-hole hydraulic conductivity test borings to target pervious zones identified during secondary characterizations
- Test borings or pits should be logged and sampled with results incorporated into secondary subsurface characterization
- A minimum acceptable hydraulic conductivity is 0.5 inches /hour
- Identify zones with acceptable hydraulic conductivity's, establish thickness, depth, and distribution of zones
- Evaluate if pervious zones can accommodate the cumulative water quality volume (CWQV) from catchment areas feeding the basin
- Calculate the geometric mean hydraulic conductivity from all hydraulic conductivity test completed at site, or from all tests within areas that have excluded soils with hydraulic conductivity's less than 0.5 inches / hour
- Calculate Water Quality Volume (WQV) of basin according to equation 1 in Exhibit A using geometric mean hydraulic conductivity value

Evaluate if re-testing or conducting additional tests are needed to define infiltration potential

Evaluate feasibility of re-sizing basin if portions of the potential site area contain unfavorable soils for infiltration

Sites meeting above criteria

Modify Potential Basin Size
- Re-calculate basin area excluding unfavorable soil areas
- Calculate WQV of basin using geometric mean hydraulic conductivity value and re-sized surface area
- Compare basin WQV to CWQV from catchment area
- Estimate extent of any excavation of surface restrictive layers
- Evaluate if basin is still feasible as IFB

Update RWQCB on remaining potential IFB site conditions

Sites not meeting RWQCB conditions of approval → Consider other BMP's

Sites meet RWQCB conditions → Recommend for preliminary design. Evaluate sites with proposed setback modifications

Proposed setback modifications not feasible

Site fails criteria → Consider other BMP's

Site considered feasible

INFILTRATION BASIN SITE SELECTION LOGIC TREE

Project: INFILTRATION BASIN SITE SELECTION

Date: FEBRUARY 2003

Figure 32