Stormwater Impact Assessments

Connecting primary, secondary and cumulative impacts to Hawaii's Environmental Review Process

TRAINING

June 3, 2013

West Hawaii Civic Center

Presented by

PBR HAWAII

Agenda

1:00 – 1:10	Introductions
1:10 – 1:15	Background
1:15 – 1:20	Introduction of Five-Step Framework
1:20 – 1:50	Step 1: Gather pertinent data
1:50 – 2:15	Step 2: Determine appropriate level of analysis
2:15 – 2:25	BREAK
2:25 – 2:55	Step 3: Analyze data in light of proposed project
2:55 – 3:20	Step 4: Identify mitigation goals & measures
3:20 – 3:25	BREAK
3:25 – 3:35	Step 5: Summarize impacts and mitigation measures
3:35 – 3:45	Review checklist – Exercise
3:45 – 4:00	Conclusion & Questions

Background

- Guidance document purpose & need

> *"Cumulative effects assessment is neither well understood nor well implemented and is not integrated with the planning process"*
> (University of Hawai'i, 2010)

Question 1

Principles

- Clarifying how stormwater impact assessment **relates to the environmental review process**
- Acknowledging how stormwater characteristics in Hawaii's varied environments may **differ from mainland conditions**
- Incorporating **Best Management Practices** and **creative offsite practices** as mitigation measures that can be translated to permit conditions

Primary & Secondary Impacts

Primary (Direct)

- Occur at **same time** & **place** as cause
- Effects on **project site**
- Pertinent factors:
  - bare soil
  - impervious surface
  - nutrient load
  - peak flow

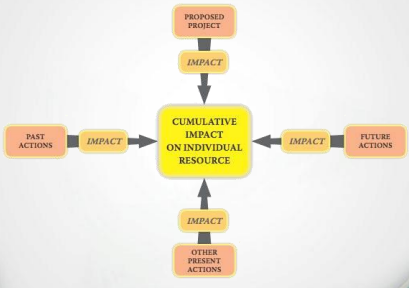
Secondary

- Occur **later in time** or **removed in distance** but reasonably **foreseeable**
- **Offsite** and **down gradient** from project
- Examples:
  - growth-inducing effects
  - ↑ sediment in down stream water body

Cumulative Impacts

- Results from **incremental impact** of the action when **added to past, present, and reasonably foreseeable future actions**
- Occurs **within boundaries of a watershed**

Cumulative Impacts



Question 2

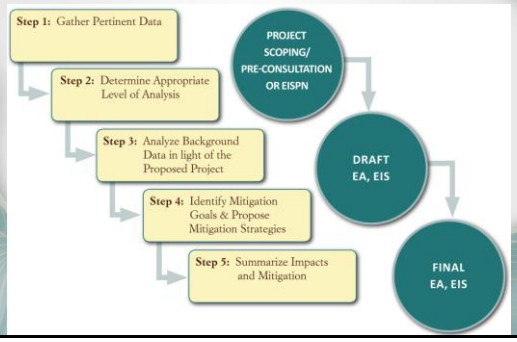
Relationship to State Planning Policies

- Hawaii State Plan Goal (HRS § 226-4 (2))
- Hawaii State Plan Priority Guideline (HRS §226-109)
- Federal Coastal Zone Management Act (HRS §205A-2)
- Significance Criteria (HAR §11-200-12)

Five-Step Framework

1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

Where does this framework fit in to the EIS process?



Five-Step Framework

1. **Gather pertinent data**
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

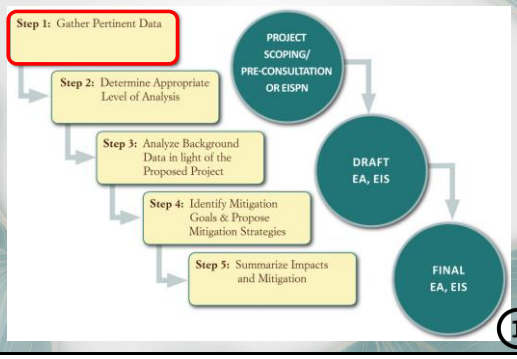
Step 1: Gather pertinent data

Objective: Collect & document pertinent data about existing site & watershed conditions

Methodology: Use best available data and early consultation to document site and watershed hydrology, stressors and sensitivity. Document anticipated stormwater permit requirements as well as management programs that pertain to site and watershed resources.

1

Where does this step fit in?



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Step 1: Gather pertinent data

"How much and where does the water flow?" (hydrology)

"What are the potential sources of water pollutants?" ("stressors")

"How resilient are the down gradient resources to pollutants?" ("sensitivity")

1

How much & where does the water flow?

1

What are the potential sources of water pollutants?

1

How resilient are the down gradient resources to pollutants?

1

Hawaii County Grading Permits

Hawaii County Code Chapter 10

- Exclusions to permit (HCC §10-3)
- Erosion & sediment control measures (HCC §10-18→10-23)
  - Height
  - Cut slopes
  - Fill slopes
  - Distance from property line
  - Area opened
  - Fill material
  - Preparation of ground surface
  - Placement & compaction
  - Vegetation
  - Drainage provisions

Exclusions to Permit

HCC §10-3

- Mining or quarrying operations
- Basements, footings, etc. of building authorized by valid permit
- Individual cemetery plots
- Sanitary filling and operation of dumps
- Exploratory excavations < 50 yd^3

Exclusions to Permit

HCC §10-3

- Agricultural operations in conformance with soil conservation practices and in accordance with an actively pursued comprehensive conservation program
- Trenching & backfilling for utility and drainage conduits
- Clearing, excavation, and filling req'd for installation of pole lines

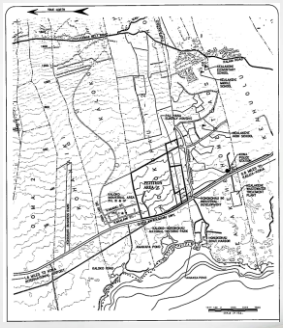
Limited Exclusion to Permit

HCC §10-3(6) & (7)

- Excavation or fill < 100 yd^3 and < 5 ft. vertical height at its highest/deepest point
  - Must follow cut slopes/fill slopes and distance to property line requirements

EXERCISE – STEP 1

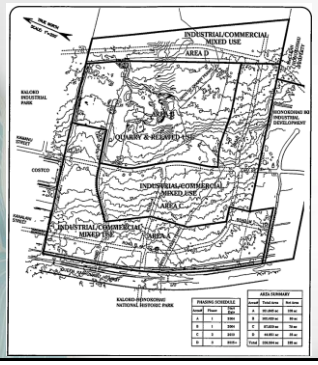
Kona Site X



Site = 336 acres Watershed = 9,545 acres

Kona Site X

Kona Site X



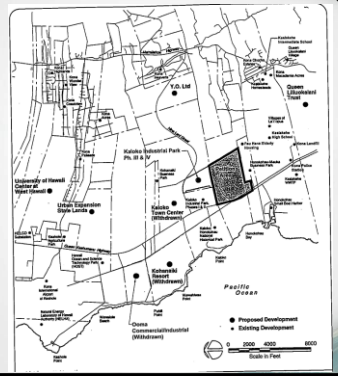
- Business park
- Industrial development
- Quarry (for 20 more years)
- Three Phases 2002-2020

Step 1 – Hydrology

How much & where does the water flow?

Existing land use/cover:

Proposed Land Uses in Region



Step 1 – Hydrology

How much & where does the water flow?

Soil type:

Step 1 – Hydrology

How much & where does the water flow?

Drainage pattern:

Step 1 – Hydrology

How much & where does the water flow?

Wetlands or embayments?

Receiving waterbodies:

Step 1 – Hydrology

How much & where does the water flow?

Slope & topography:

- Gently sloping
- 40 feet above sea level to 320 feet at mauka border

Step 1 – Hydrology

How much & where does the water flow?

Flooding hazard:

- FIRM Zone X
- Community flood insurance study – moderate or minimal hazard

Annual rainfall and seasonal distribution:

- 15-20-inches per year
- 1.63-inches per hour for 10-year storm
- 2.02 inches per hour for 50-year storm
- Mostly during winter storm season

Step 1 – Hydrology

How much & where does the water flow?

Evapotranspiration & interception:

Step 1 – Hydrology

How much & where does the water flow?

State LUD: Conservation

County General Plan: Industrial & Urban Expansion

Zoning: Open

Aquifer: Thin, brackish, slow moving basal lens in contact with saline water

Existing infrastructure: None

Step 1 – Stressors

What are the potential sources of water pollutants?

303(d) waterbodies? No.

Waterbody classification:

- Inland waters - Class 2
- Marine waters – Class AA

Step 1 – Sensitivity

How resilient are down gradient resources to pollutants?

Potentially impacted resources:

- Aquatic?
- Riparian?
- Cultural?
- Recreational?
- Ag demand?
- Aquifer?

Step 1 – Sensitivity

How resilient are down gradient resources to pollutants?

Management considerations:

- Marine Reserves or MPAs?
- State WQ standards?
- NPDES Permit?
- Presence of Threatened or Endangered species?

(consider site and watershed)

Five-Step Framework

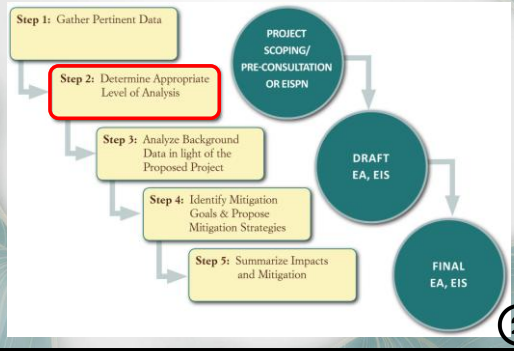
1. Gather pertinent data
2. **Determine appropriate level of analysis**
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

Step 2: Determine appropriate level of analysis

Objective: Determine what level of analysis is sufficient to give stormwater concerns appropriate consideration in the planning phase.

Methodology: Stormwater volume generated on site. Does the stressors + sensitivity + intensity = need for an estimate of volume of pollutants?

Where does this step fit in?



2

Analysis Considerations

2

EXERCISE – STEP 2

Step 2 – Watershed Impairment/Stressors

Has a TMDL been established for any stream segment in the sub-watershed or for the receiving waterbody?

Is there an impaired stream or waterbody in the sub-watershed that is classified as category 5 under §303(d) of the Clean Water Act?

Step 2 – Watershed Impairment/Stressors

Is there an impaired stream or waterbody in the sub-watershed that is classified as category 4a, 4b, 4c, or 3 under §303(d) of the Clean Water Act?

Step 2 – Watershed Sensitivity

Is the receiving waterbody:

- Designated Class 1 or Class AA?
- Subject to Hawai'i's Local Action Strategy to Address Land Based Pollution Threats to Coral Reefs?
- Identified as sensitive on Hawai'i Watershed Priority Project?

Step 2 – Watershed Sensitivity

Do site conditions or combination of site conditions lend themselves to excessive runoff?

Step 2 – Development Intensity

Is the site located in a small urban watershed or sub-watershed (measuring no more than 1 square mile in area and anywhere between 25% and 100% impervious surfaces)?

Step 2 – Development Intensity

Is the action subject to an NPDES permit?

Is LEED® certification desired?

Is the action subject to a County Grading, Grubbing, Tree removal or Erosion and Sediment Control Permit?

Step 2 – Summary

- Sufficient to prepare for applicable NPDES and grading req's
- Using existing data and knowledge of the proposed action, document possible pollutant inputs. If potential pollutants inputs are expected to directly impact Class I or Class AA waters, consider an analysis that estimates the pre- and post-development runoff volume and volume of pollutants in the runoff pre- and post-development.

Five-Step Framework

1. Gather pertinent data
2. Determine appropriate level of analysis
3. **Analyze background information in light of proposed project**
4. Identify mitigation goals & propose mitigation concepts
5. Summarize impacts & mitigation

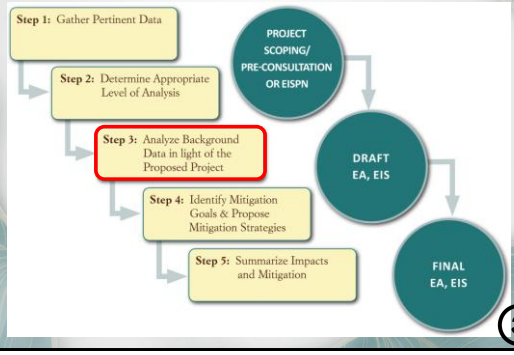
Step 3: Analyze background information in light of the proposed action

3a. Analyze primary (direct) impacts at the project scale

3b. Secondary impacts (offsite, down gradient)

3c. Cumulative impacts

Where does this step fit in?



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Step 3a: Primary impacts

Objective: Discuss impacts & proposed mitigation during construction.

Discuss anticipated direct impacts from the proposed action

3

Step 3a: Primary impacts

- Construction impacts
  - NPDES permit?
  - Grading permit?
- Pre- vs. Post-development Long-term impacts

Image source: www.bluewaterbaltimore.org

3

Step 3b: Secondary impacts

Objective: The analysis of secondary impacts should assess:

- Potential for down gradient flooding
- Impacts to down gradient sensitive resources

Image source: NOAA Restoration Center

3

Step 3c: Cumulative impacts

Objective: The analysis of cumulative impacts should assess the impacts on sensitive resources from all parts of the watershed relative to existing conditions and potential buildout.

3

Step 3c: Cumulative impacts

Methodology: **Minimum planning-level assessment**

- Assess existing status of sensitive resources
  - Discuss past actions
  - Discuss present actions
  - Discuss reasonably foreseeable future impacts

3

Step 3c: Cumulative impacts

Methodology: Small, urban watershed assessment

- Assess existing buildout relative to potential buildout
  - Existing impervious area
  - State LUD "Urban" as indicator of future imperviousness

3

Step 3c: Cumulative impacts

Methodology: Watershed modeling for unique circumstances

- Necessity determined in Step 2
- Review for appropriate calculations and summarized results

3

Question 3

EXERCISE – STEP 3

Five-Step Framework

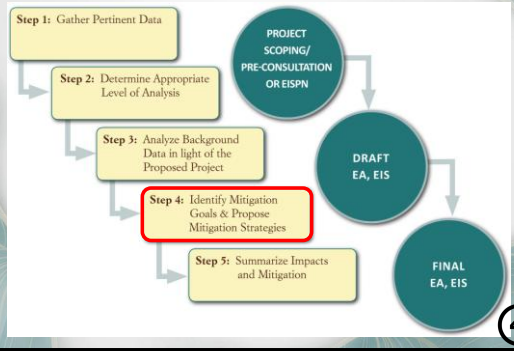
1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. **Identify mitigation goals & propose mitigation concepts**
5. Summarize impacts & mitigation

Step 4: Identify mitigation goals & propose mitigation strategies

Objective: Integrate the primary, secondary, and cumulative impacts to determine the desired extent of mitigation, while considering site and watershed conditions to formulate mitigation strategies.

4

Where does this step fit in?



4

Identify mitigation goals

- Robust enough to support a FONSI
- Anticipate required permits
- Acknowledge role of engineering in design development

Clear in concept, but not overly prescriptive!

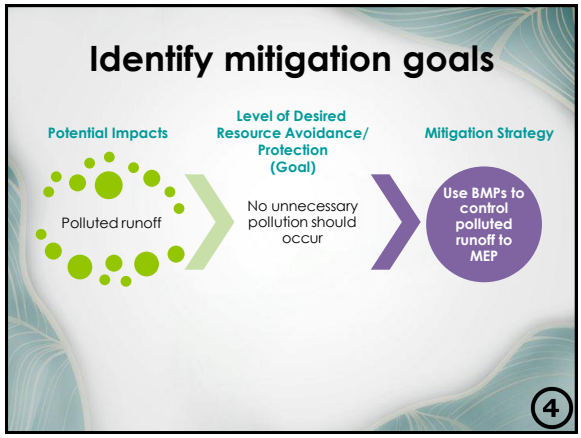
4

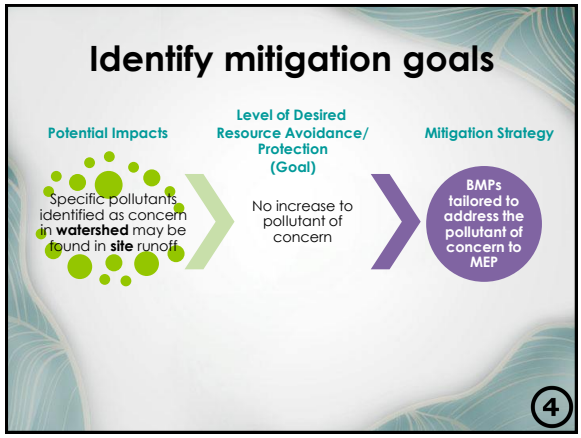
Identify mitigation goals

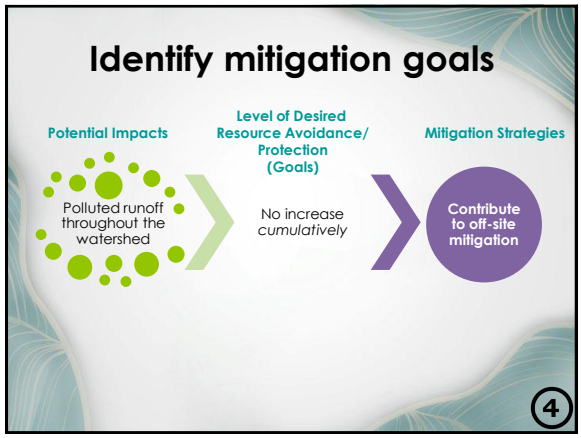
Mitigation performance criteria

- Maximum extent practicable
- Best available technology
- Range of outcomes

4


Identify mitigation goals
Potential Impacts
Level of Desired Resource Avoidance/ Protection (Goal)
Mitigation Strategy
Polluted runoff
No unnecessary pollution should occur
Use BMPs to control polluted runoff to MEP
4


Identify mitigation goals
Potential Impacts
Level of Desired Resource Avoidance/ Protection (Goal)
Mitigation Strategy
Specific pollutants identified as concern in **watershed** may be found in **site** runoff
No increase to pollutant of concern
BMPs tailored to address the pollutant of concern to MEP
4


Identify mitigation goals
Potential Impacts
Level of Desired Resource Avoidance/ Protection (Goals)
Mitigation Strategies
Polluted runoff throughout the watershed
No increase *cumulatively*
Contribute to off-site mitigation
4

Mitigation Phases

Design Phase	Construction Phase	Operational Phase
Site planner	Contractor	Owner & Successors
Plan or Site Approval; Grading Permit; Building Permit	NPDES or Grading Permit	?

4

Question 4

BMP Strategy Considerations

- Low Impact Development Concepts
- LEED© Standards
- Innovative
- Permanent vs. Temporary

4

EXERCISE – STEP 4

Five-Step Framework

1. Gather pertinent data
2. Determine appropriate level of analysis
3. Analyze background information in light of proposed project
4. Identify mitigation goals & propose mitigation concepts
5. **Summarize impacts & mitigation**

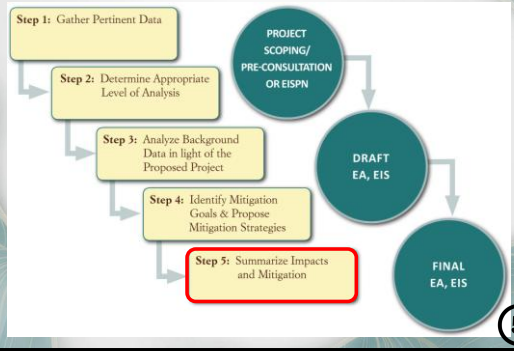
Step 5: Summarize impacts & mitigation applicable to project

Objective: Documentation of impacts, mitigation measures and their projected results.

Methodology: The Draft EA or EIS should summarize all anticipated impacts as described in HAR §200-11(I.) as well as proposed mitigation strategy as described in HAR §200-11(M.)

5

Where does this step fit in?



Reviewer's Checklist Exercise

- Using the Reviewer's Checklist in Appendix C, analyze the provided example for completeness.

Thank you!

Time for questions or comments

MAHALO!

The Guidance Document and Training prepared for the Hawaii Office of Planning, Coastal Zone Management Program by:

PBR HAWAII

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