

# WQX v2.1 Biological and Habitat Schema Overview

# WQX schema v1.0

- The physical conditions in the environment at the time of a site visit.
- The chemical and bacteriological make-up of the water sampled.
- Chemical analyses of fish tissue collected.



# WQX schema v2.0 and v2.1

- Biological Taxon Abundance data, including population census, frequency class, group summaries, and individual results
- Reference site information
- Toxicity data
- Habitat Assessment scores and their related metric scores
- Biological Index scores and their related metric scores

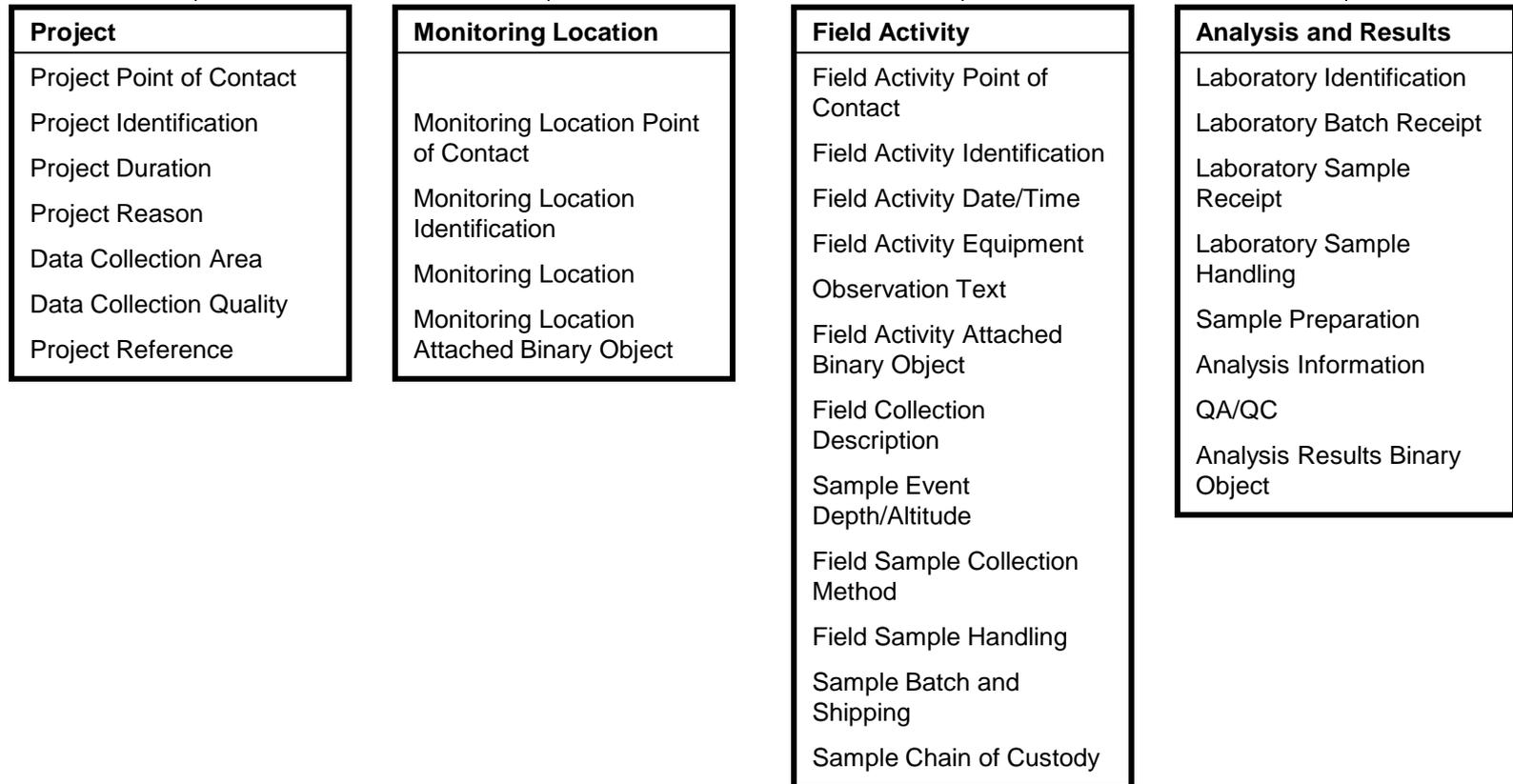


# WQX Schema

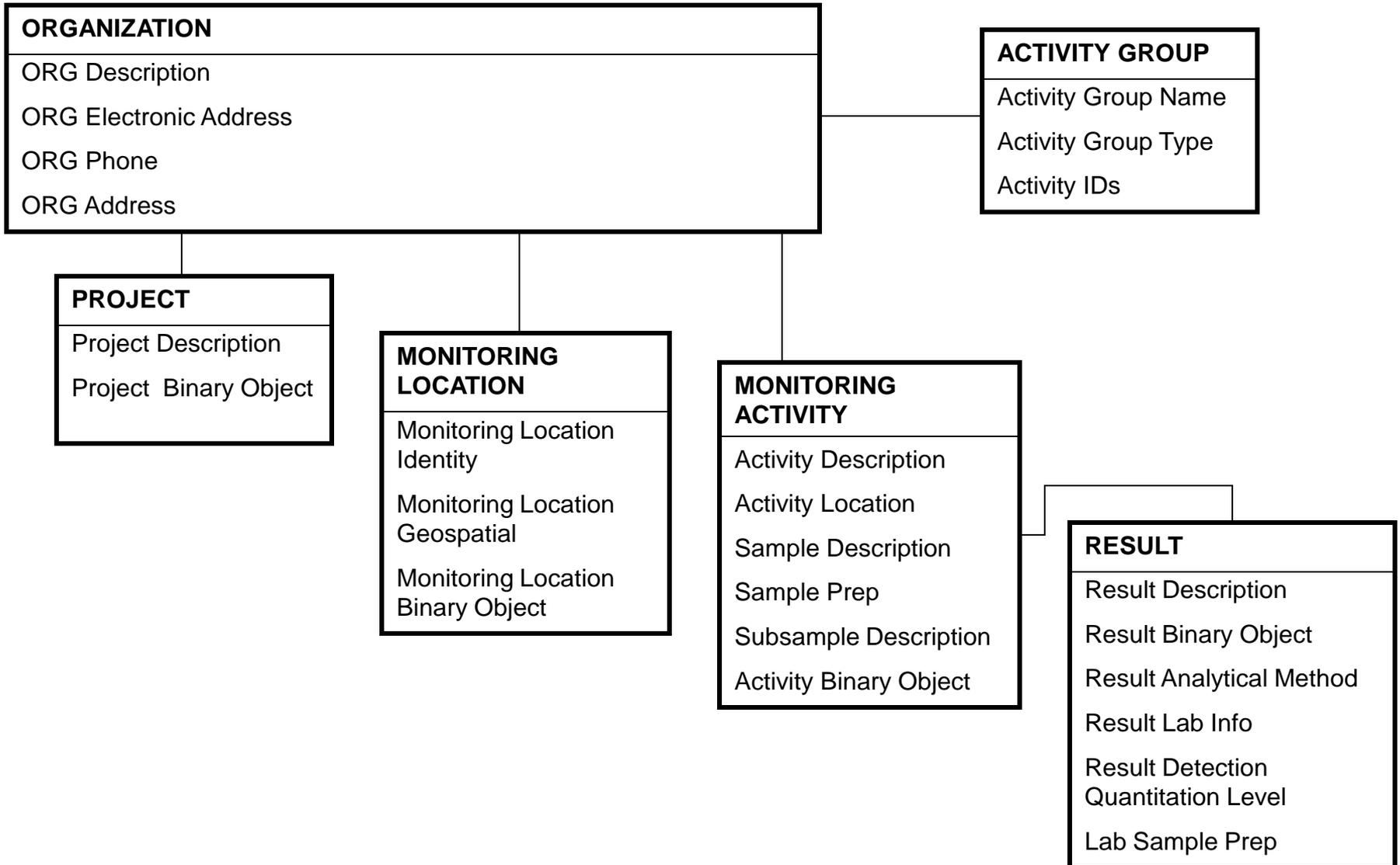
- Common set of data elements and business rules that everyone uses when submitting data
- Database independent – XML can be created out of any type of database
- Insert / Update vs. Delete Schema
- WQX v1.0 → Based on Environmental Analysis, Sampling and Results (ESAR) data standard
- WQX v2.0 and 2.1 → No data standard like there was with physical / chemical

# Overview of Core ESAR

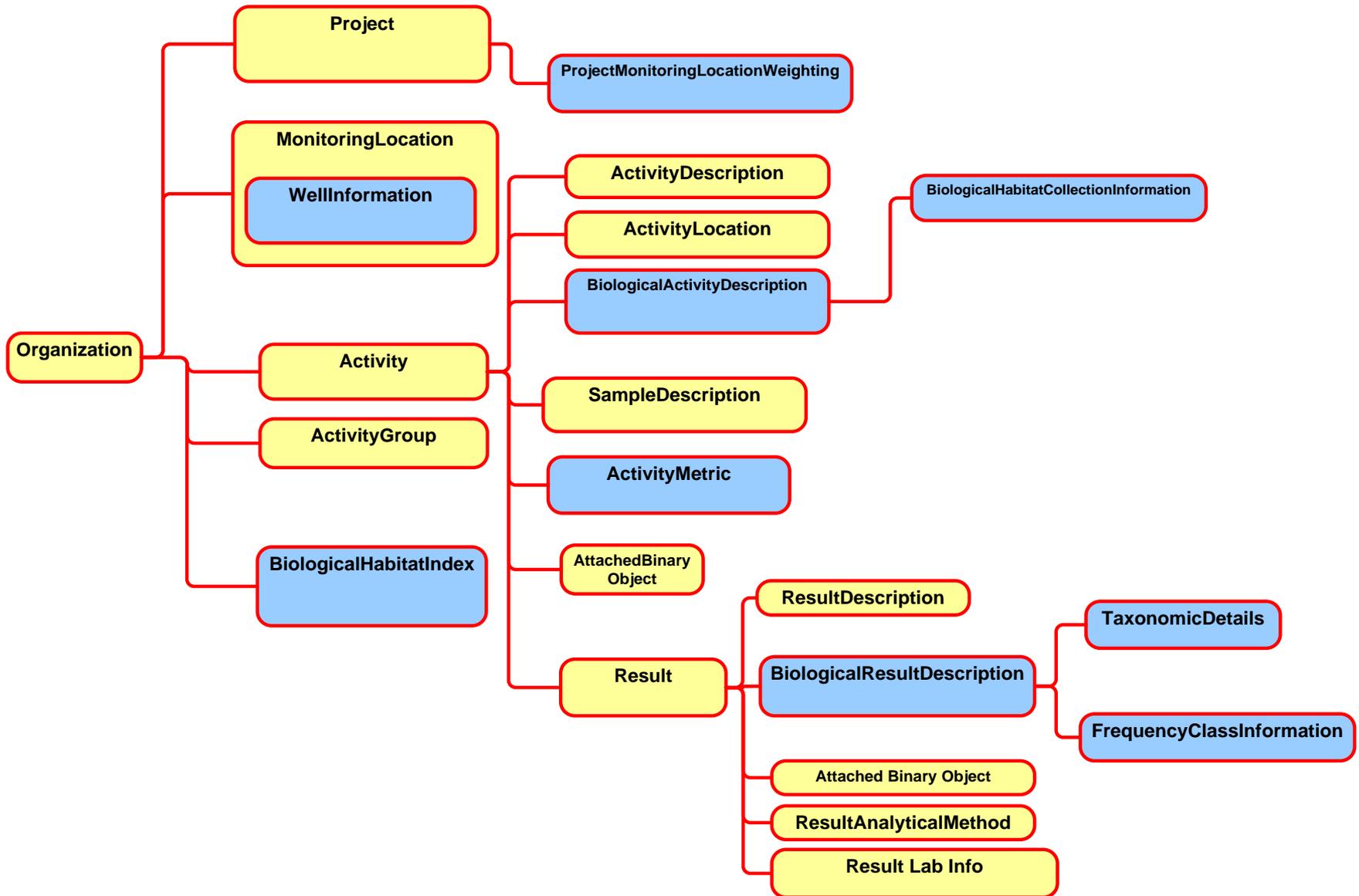
## Environmental Sampling, Analysis, and Results



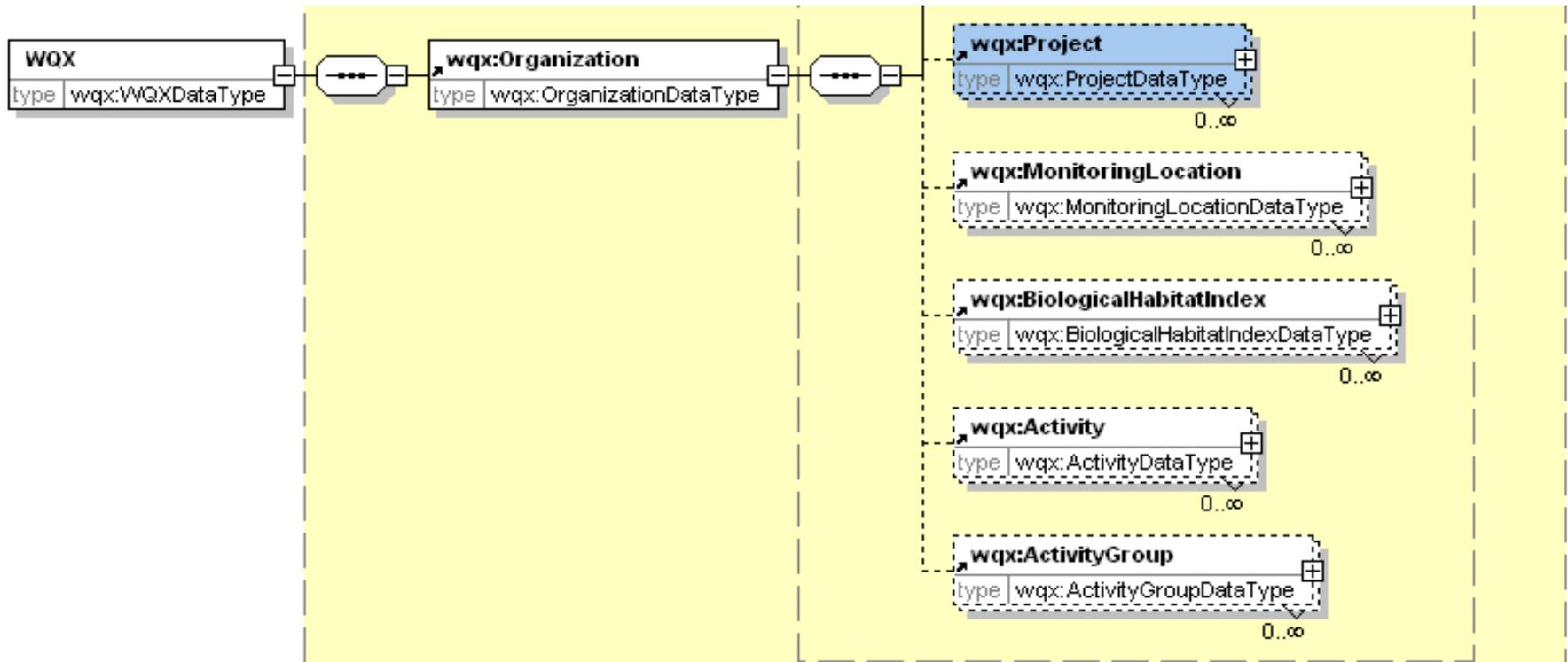
# WQX Schema Data Categories



# High Level View of v2.1



# Projects

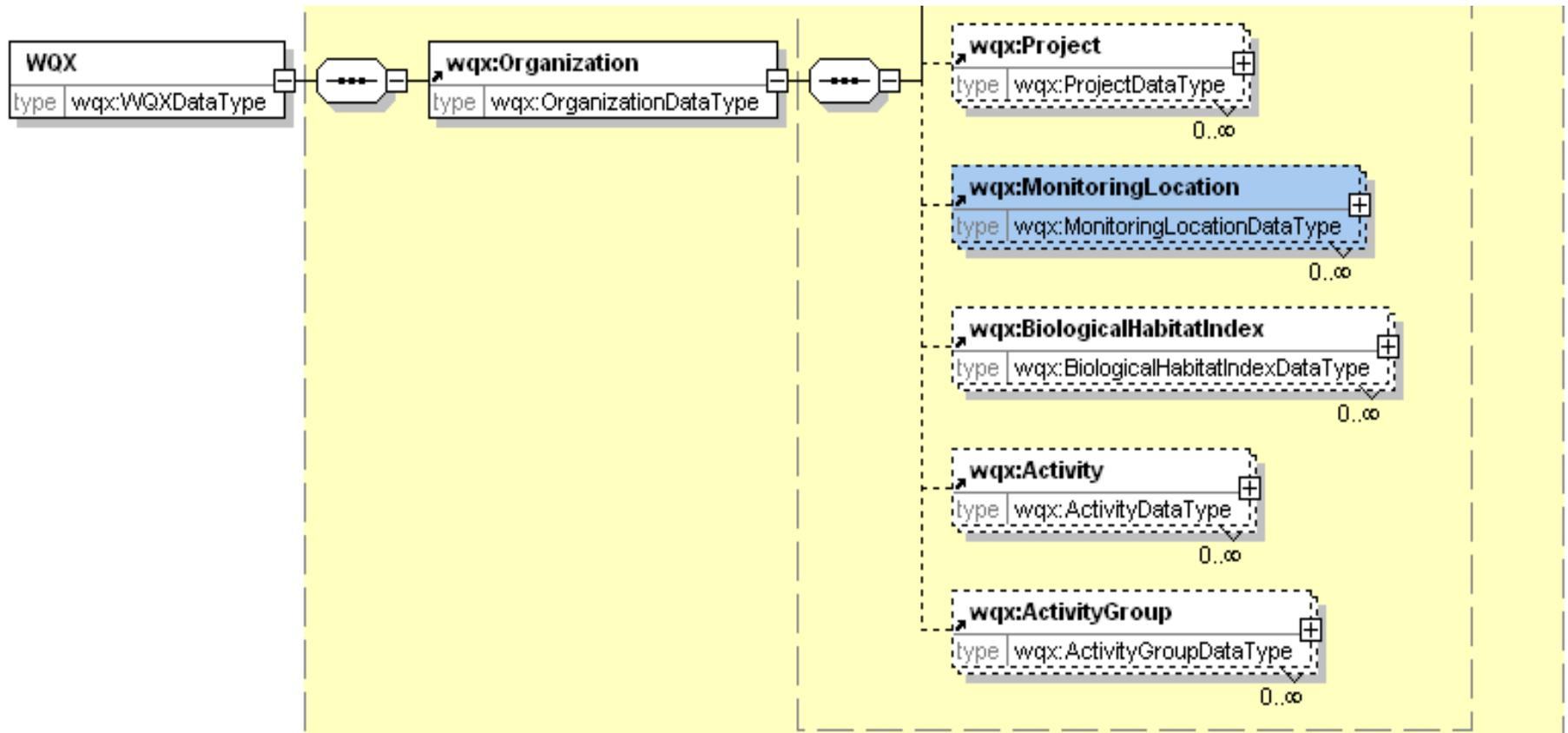




- Basic Project Info.
  - ID
  - Name
  - Description
- QAPP Approval Info.
- Probabalistic Survey Info
  - Project Monitoring Location Weighting
  - Statistical Stratum
  - Reference Location Type

Project
<b>ProjectIdentifier</b>
<b>ProjectName</b>
ProjectDescriptionText
SamplingDesignTypeCode
QAPPApprovedIndicator
QAPPApprovalAgencyName
AttachedBinaryObject (0 or more)
<b>BinaryObjectFileName</b>
<b>BinaryObjectFileTypeCode</b>
ProjectMonitoringLocationWeighting (0 or more)
<b>MonitoringLocationIdentifier</b>
LocationWeightingFactorMeasure
MeasureValue
MeasureUnitCode
StatisticalStratumText
LocationCategoryName
LocationStatusName
ReferenceLocationTypeCode
ReferenceLocationStartDate
ReferenceLocationEndDate
ReferenceLocationCitation
<b>ResourceTitleName</b>
ResourceCreatorName
ResourceSubjectText
ResourcePublisherName
<b>ResourceDate</b>
<b>ResourceIdentifier</b>
CommentText

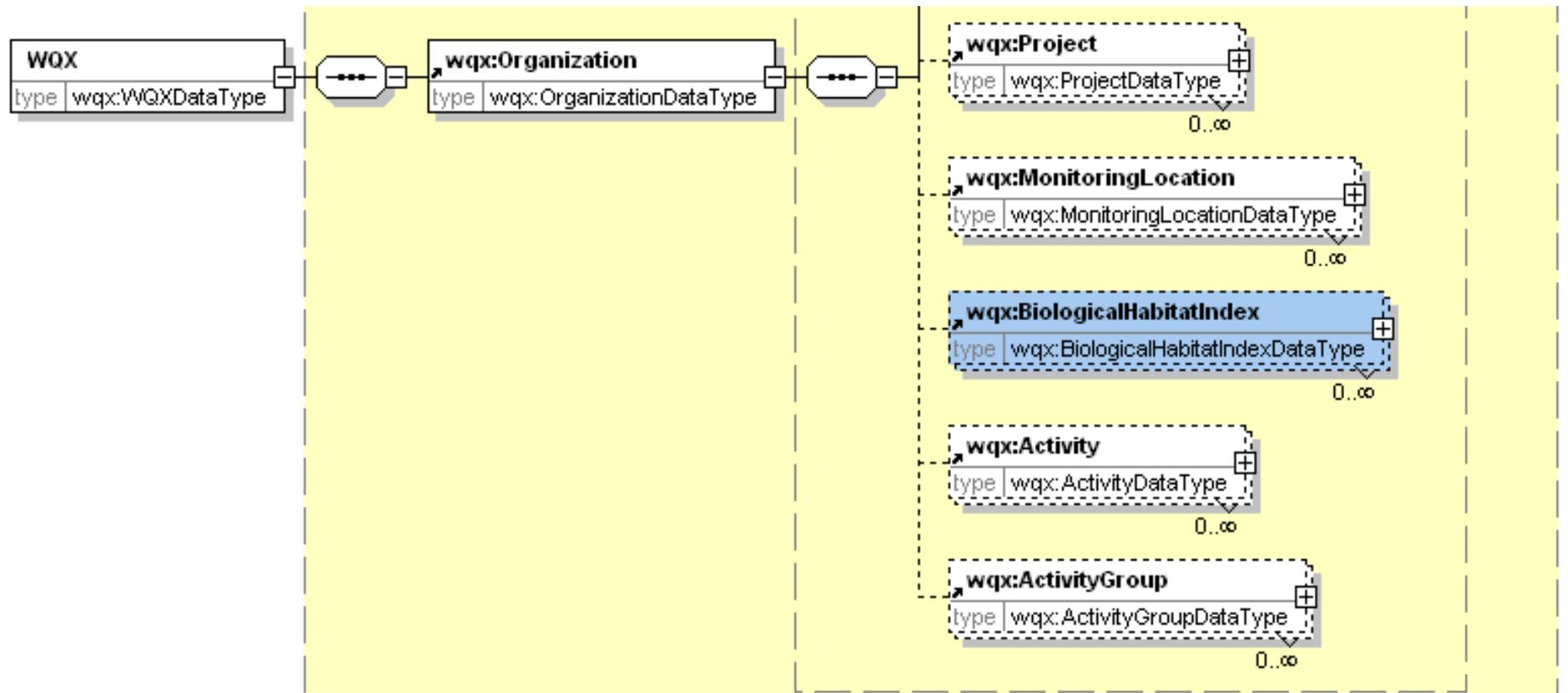
# Monitoring Locations



- Basic Monitoring Location Info.
  - ID
  - Name
  - Type
  - Geospatial Info
- Well Information
  - Well Type
  - Aquifer Name
  - Formation Type
  - Well Hole Depth

MonitoringLocation
<b>MonitoringLocationIdentity</b>
MonitoringLocationIdentifier
MonitoringLocationName
MonitoringLocationTypeName
MonitoringLocationDescriptionText
HUCEightDigitCode
HUCTwelveDigitCode
TribalLandIndicator
TribalLandName
AlternateMonitoringLocationIdentity (0 or more)
MonitoringLocationIdentifier
MonitoringLocationIdentifierContext
<b>MonitoringLocationGeospatial</b>
LatitudeMeasure
LongitudeMeasure
SourceMapScaleNumeric
HorizontalAccuracyMeasure
MeasureValue
MeasureUnitCode
HorizontalCollectionMethodName
HorizontalCoordinateReferenceSystemDatumName
VerticalMeasure
MeasureValue
MeasureUnitCode
VerticalCollectionMethodName
VerticalCoordinateReferenceSystemDatumName
CountryCode
StateCode
CountyCode
<b>WellInformation</b>
WellTypeText
AquiferName
FormationTypeText
WellHoleDepthMeasure
MeasureValue
MeasureUnitCode
AttachedBinaryObject (0 or more)
BinaryObjectFileName
BinaryObjectFileTypeCode

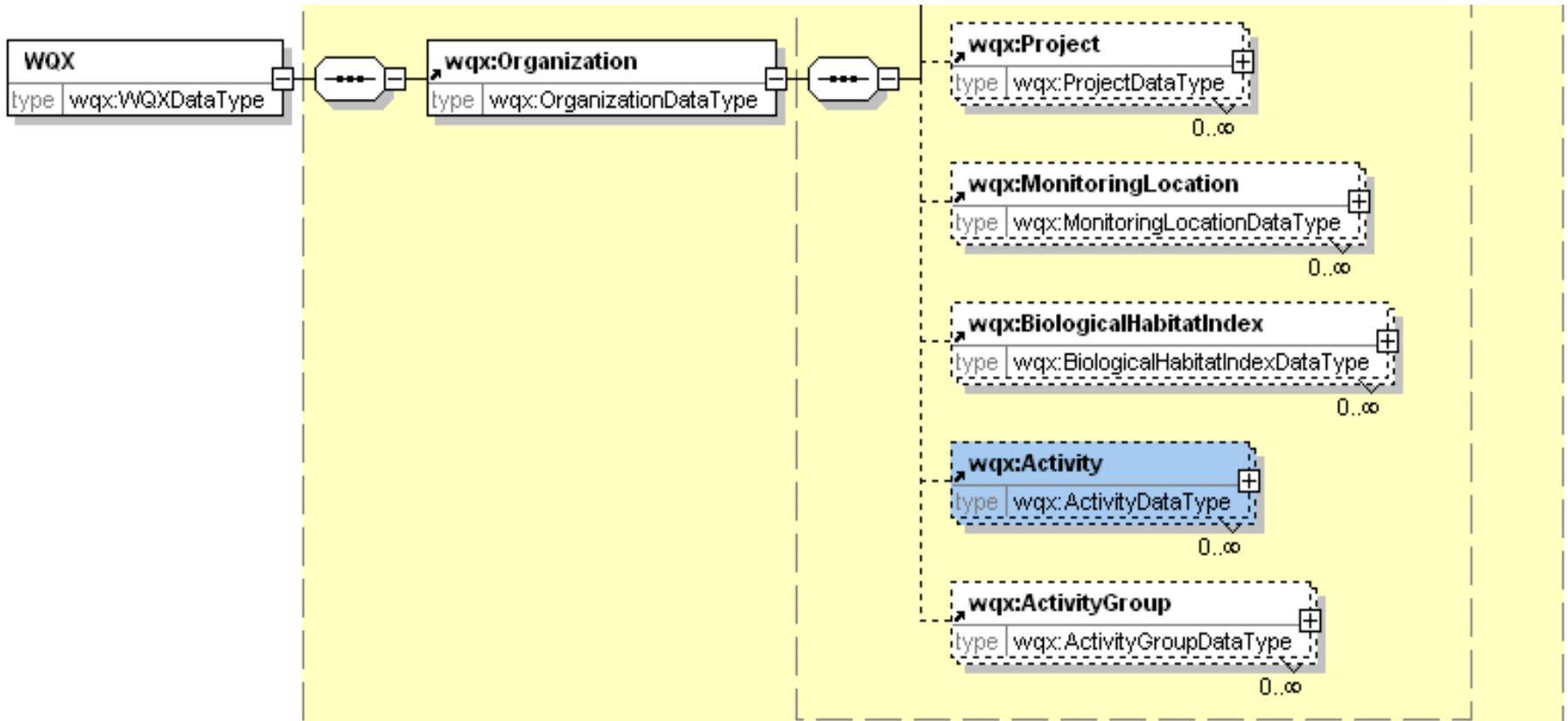
# Biological Habitat Index



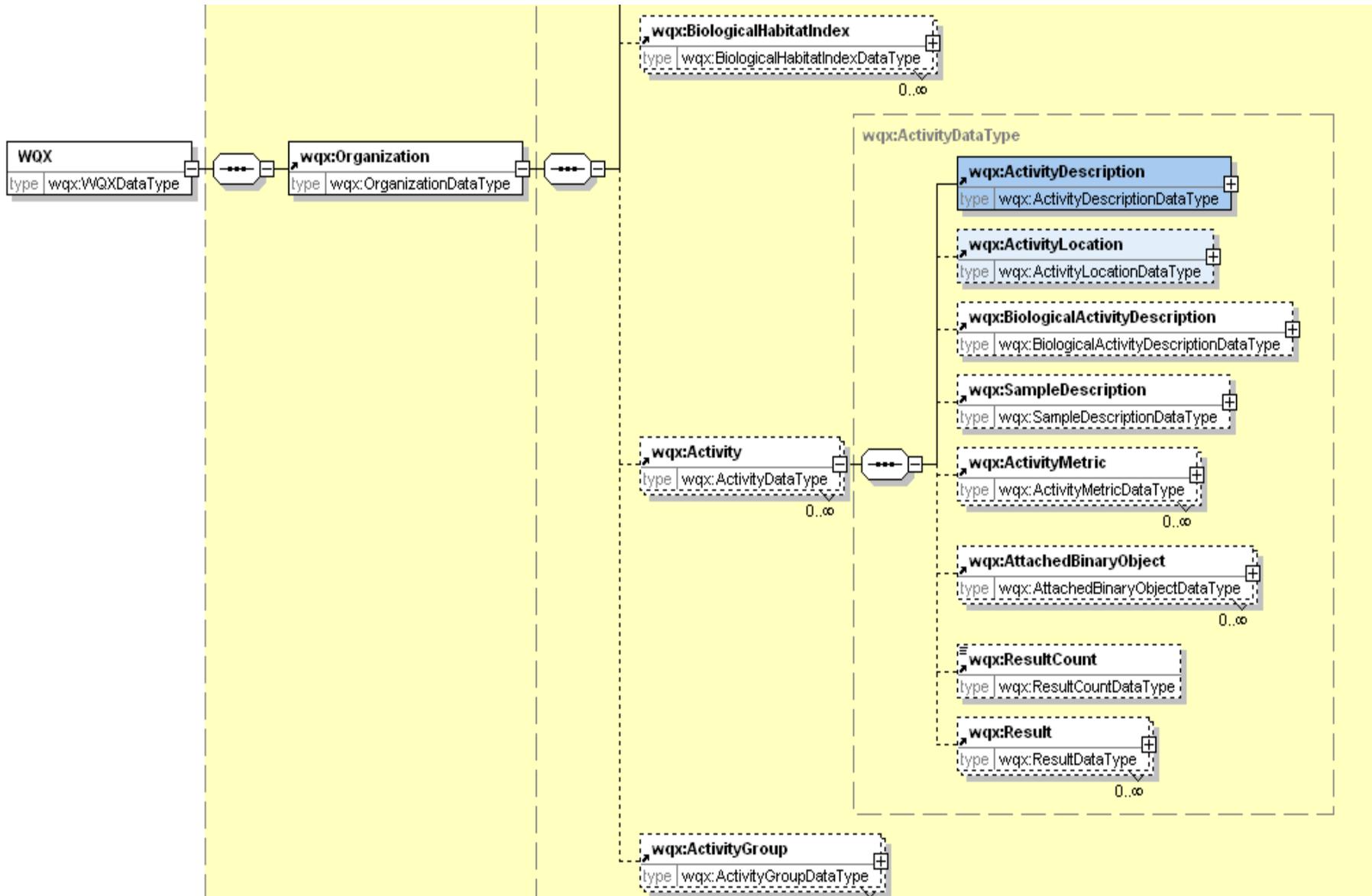
- Biological Habitat Index
  - User Defined
  - No Domain Value List
  - Associated at the Monitoring Location level, individual Metrics associated at the Activity Level
  - Scale important to give context to score
  - Citation info. is helpful

BiologicalHabitatIndex
IndexIdentifier
IndexType
IndexTypeIdentifier
IndexTypeIdentifierContext
IndexTypeName
IndexTypeCitation
ResourceTitleName
ResourceCreatorName
ResourceSubjectText
ResourcePublisherName
ResourceDate
ResourceIdentifier
IndexTypeScaleText
IndexScoreNumeric
IndexQualifierCode
IndexCommentText
IndexCalculatedDate
MonitoringLocationIdentifier

# Activities



# Activity Description

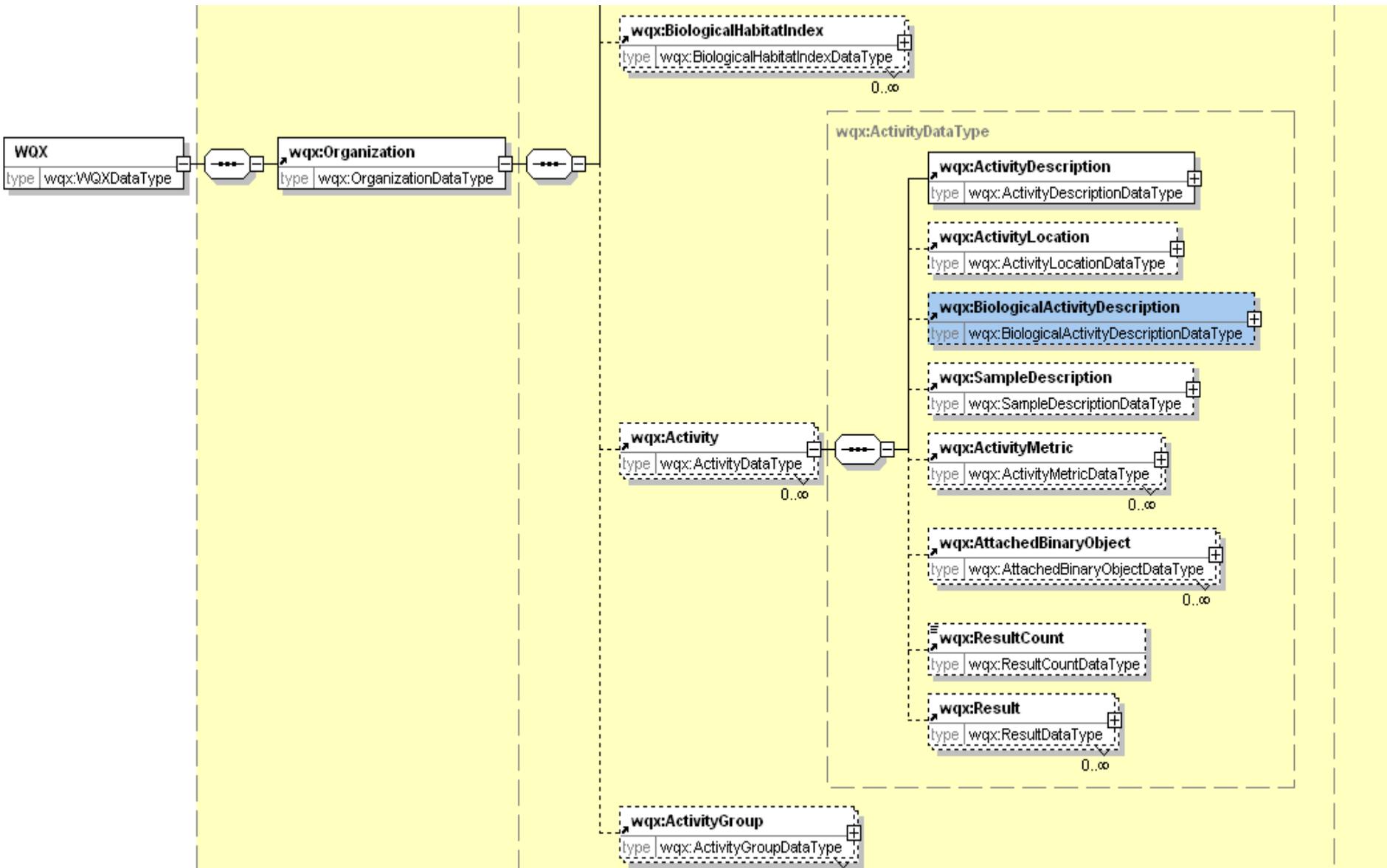


# Activity Part 1

- ActivityIdentifier
- ActivityStartDate and Time
- ActivityDepths
- ActivityLocation
- Associated Monitoring Location
- Associated Project

Activity
ActivityDescription
ActivityIdentifier
ActivityTypeCode
ActivityMediaName
ActivityMediaSubdivisionName
ActivityStartDate
ActivityStartTime
Time
TimeZoneCode
ActivityEndDate
ActivityEndTime
Time
TimeZoneCode
ActivityRelativeDepthName
ActivityDepthHeightMeasure
MeasureValue
MeasureUnitCode
ActivityTopDepthHeightMeasure
MeasureValue
MeasureUnitCode
ActivityBottomDepthHeightMeasure
MeasureValue
MeasureUnitCode
ActivityDepthAltitudeReferencePointText
ProjectIdentifier (1 or more)
ActivityConductingOrganizationText (0 or more)
MonitoringLocationIdentifier
ActivityCommentText
ActivityLocation
LatitudeMeasure
LongitudeMeasure
SourceMapScaleNumeric
HorizontalCollectionMethodName
HorizontalCoordinateReferenceSystemDatumName

# Biological Activity Description

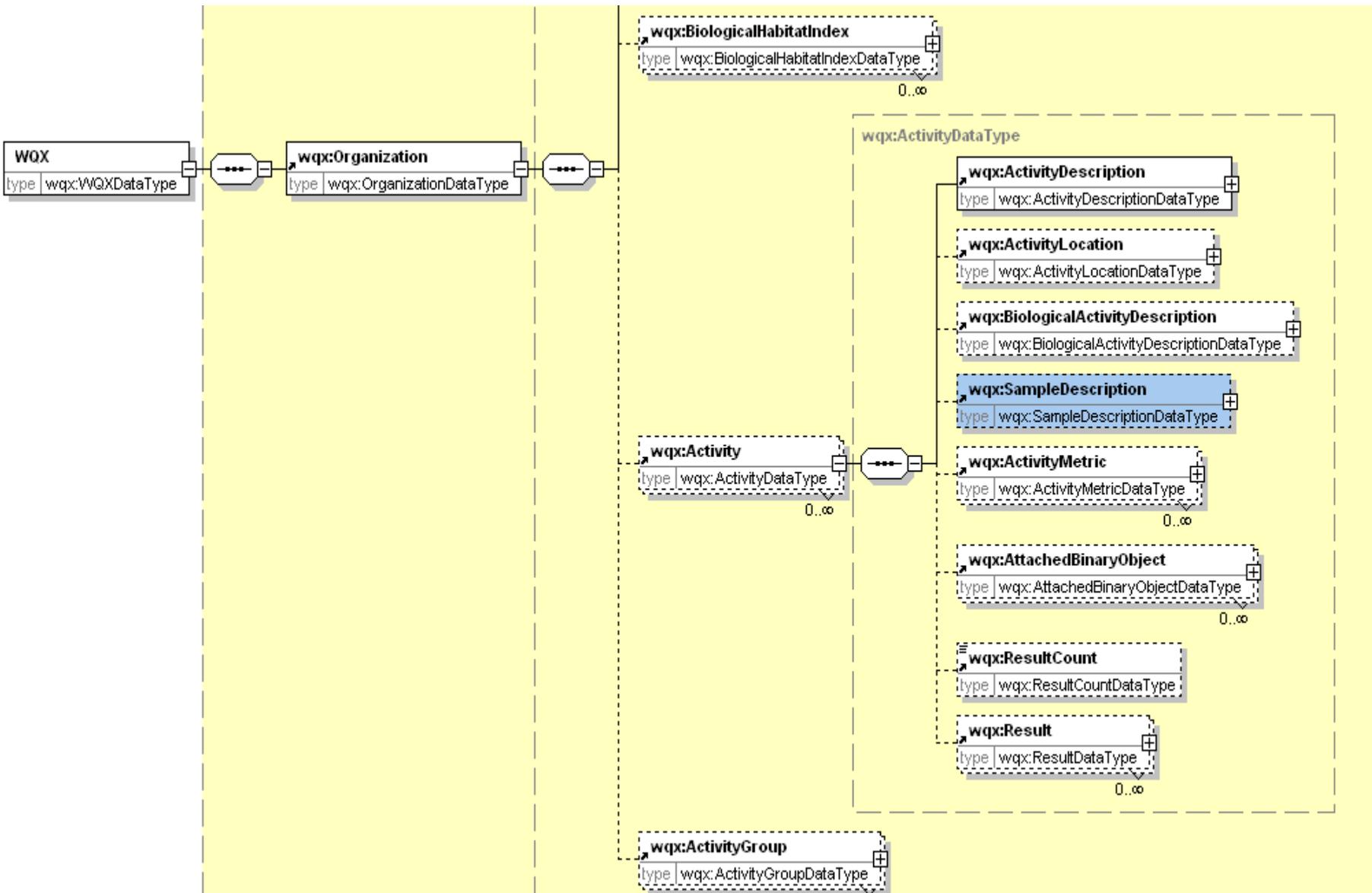


## Activity Part 2

- Biological Activity  
Description
- Biological Habitat Collection  
Information
  - CollectionDuration
  - Transect Related Info.
  - NetInformation
- Toxicity Test Type
  - Acute or Chronic

BiologicalActivityDescription  
AssemblageSampledName  
BiologicalHabitatCollectionInformation  
CollectionDuration  
MeasureValue  
MeasureUnitCode  
SamplingComponentName  
SamplingComponentPlaceInSeriesNumeric  
ReachLengthMeasure  
MeasureValue  
MeasureUnitCode  
ReachWidthMeasure  
MeasureValue  
MeasureUnitCode  
PassCount  
NetInformation  
NetTypeName  
NetSurfaceAreaMeasure  
MeasureValue  
MeasureUnitCode  
NetMeshSizeMeasure  
MeasureValue  
MeasureUnitCode  
BoatSpeedMeasure  
MeasureValue  
MeasureUnitCode  
CurrentSpeedMeasure  
MeasureValue  
MeasureUnitCode  
ToxicityTestType

# Sample Description

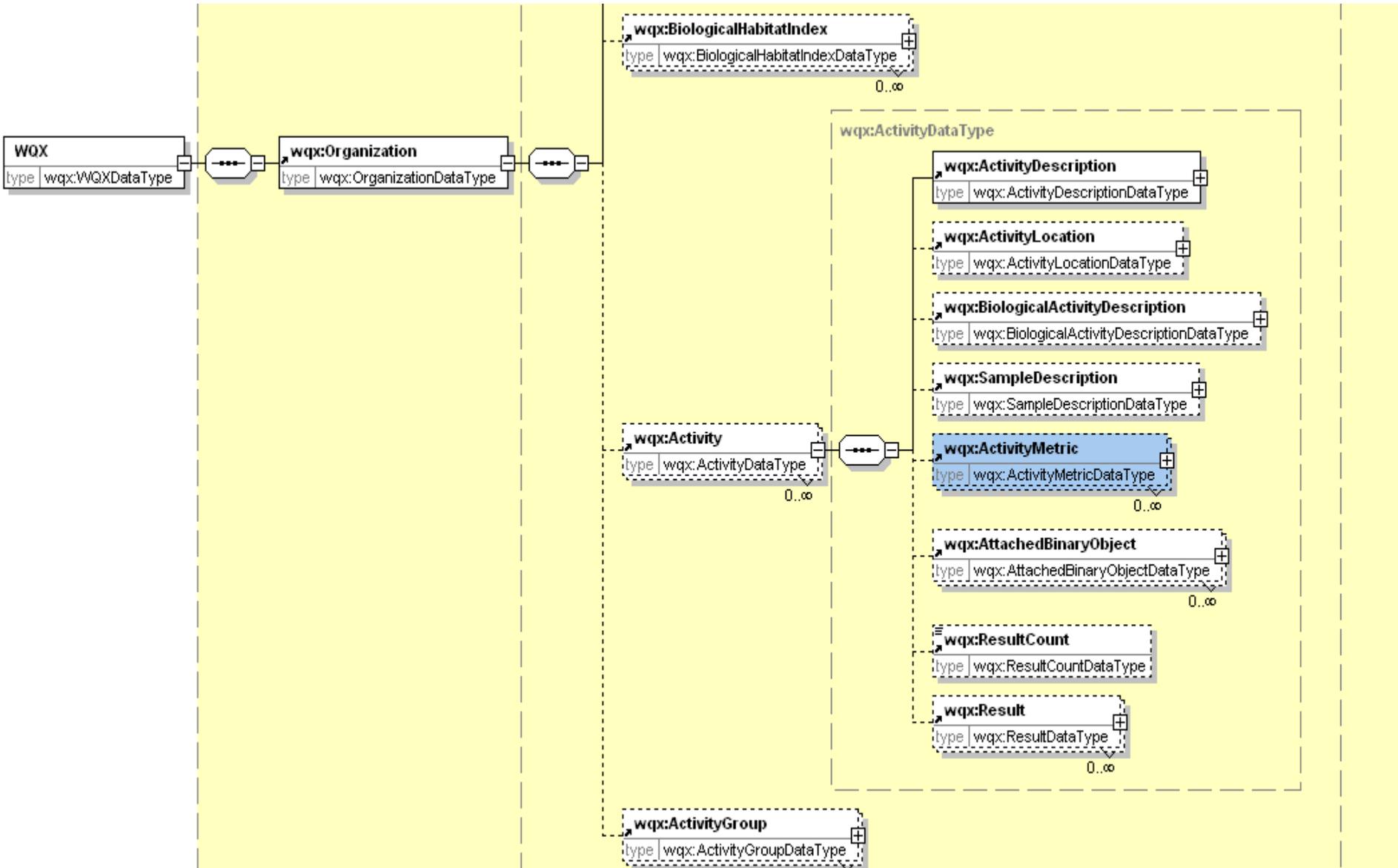


## Activity Part 3

- Sample Collection and Sample Preparation Methods

SampleDescription  
  **SampleCollectionMethod**  
    **MethodIdentifier**  
    **MethodIdentifierContext**  
    **MethodName**  
    MethodQualifierTypeName  
    MethodDescriptionText  
  **SampleCollectionEquipmentName**  
  SampleCollectionEquipmentCommentText  
SamplePreparation  
  **SamplePreparationMethod**  
    **MethodIdentifier**  
    **MethodIdentifierContext**  
    **MethodName**  
    MethodQualifierTypeName  
    MethodDescriptionText  
  **SampleContainerTypeName**  
  **SampleContainerColorName**  
  ChemicalPreservativeUsedName  
  ThermalPreservativeUsedName  
  **SampleTransportStorageDescription**  
AttachedBinaryObject (0 or more)  
  **BinaryObjectFileName**  
  **BinaryObjectFileTypeCode**

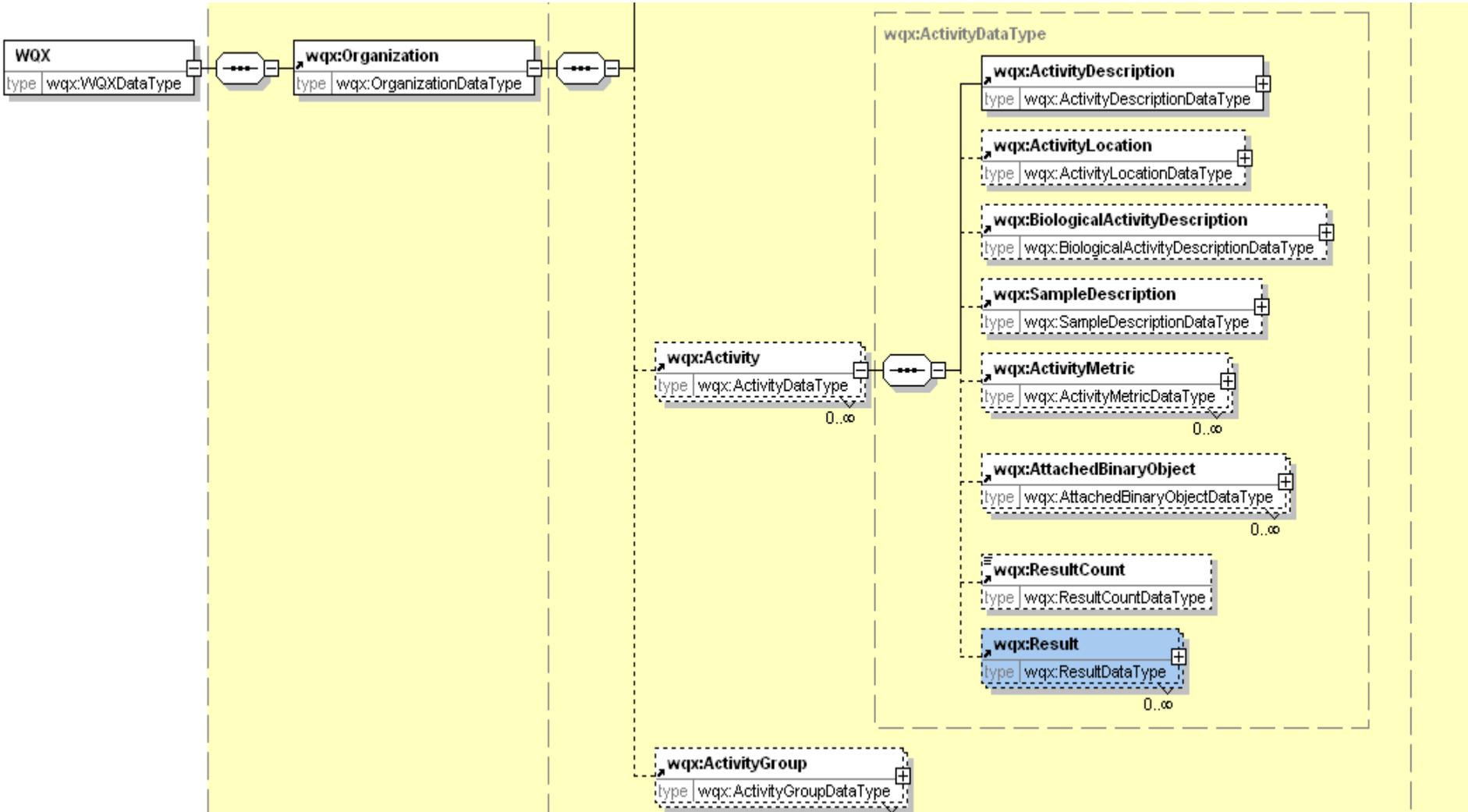
# Activity Metric



- **Activity Metric**
  - Associated at Activity Level
  - Identifier, Context, Name is similar to how the schema handles Analytical Methods
  - May or may not be from domain values list
- **Index Identifier**

ActivityMetric
<b>ActivityMetricType</b>
MetricTypeIdentifier
MetricTypeIdentifierContext
MetricTypeName
MetricTypeCitation
ResourceTitleName
ResourceCreatorName
ResourceSubjectText
ResourcePublisherName
ResourceDate
ResourceIdentifier
MetricTypeScaleText
FormulaDescriptionText
MetricValueMeasure
MeasureValue
MeasureUnitCode
MetricScoreNumeric
MetricCommentText
IndexIdentifier (0 or more)

# Result



**ResultDescription**

DataLoggerLineName  
 ResultDetectionConditionText\*  
**CharacteristicName\***  
 MethodSpeciationName\*  
 ResultSampleFractionText\*  
 ResultMeasure  
     ResultMeasureValue\*\*  
     MeasureUnitCode\*  
     MeasureQualifierCode\*  
 ResultStatusIdentifier\*  
 StatisticalBaseCode\*  
 ResultValueTypeName\*  
 ResultWeightBasisText\*  
 ResultTimeBasisText\*  
 ResultTemperatureBasisText\*  
 ResultParticleSizeBasisText  
 DataQuality  
     PrecisionValue  
     BiasValue  
     ConfidenceIntervalValue  
     UpperConfidenceLimitValue  
     LowerConfidenceLimitValue  
 ResultCommentText  
 ResultDepthHeightMeasure  
     MeasureValue  
     MeasureUnitCode\*  
 ResultDepthAltitudeReferencePointText  
 ResultSamplingPointName

**BiologicalResultDescription**

**BiologicalIntentName\***  
 BiologicalIndividualIdentifier  
**SubjectTaxonomicName\***  
 UnidentifiedSpeciesIdentifier  
 SampleTissueAnatomyName\*  
 GroupSummaryCountWeight  
     MeasureValue  
     MeasureUnitCode\*  
 TaxonomicDetails  
     CellFormName\*  
     CellShapeName\*  
     HabitName\* (0 to 3)  
     VolviturismName\*  
     TaxonomicPollutionTolerance  
     TaxonomicPollutionToleranceScaleText  
     TrophicLevelName  
     FunctionalFeedingGroupName (0 to 3)  
     TaxonomicDetailsCitation  
         ResourceTitleName  
         ResourceCreatorName  
         ResourceSubjectText  
         ResourcePublisherName  
         ResourceDate  
         ResourceIdentifier  
 FrequencyClassInformation (0 to 3)  
     FrequencyClassDescriptorCode\*  
     FrequencyClassDescriptorUnitCode\*  
     LowerClassBoundValue  
     UpperClassBoundValue  
 AttachedBinaryObject (0 or more)  
     BinaryObjectFileName  
     BinaryObjectTypeCode

**ResultAnalyticalMethod**

**MethodIdentifier\*\***  
**MethodIdentifierContext\***  
 MethodName  
 MethodQualifierTypeName  
 MethodDescriptionText  
**ResultLabInformation**  
 LaboratoryName  
 AnalysisStartDate  
 AnalysisStartTime  
     Time  
     TimeZoneCode\*  
 AnalysisEndDate  
 AnalysisEndTime  
     Time  
     TimeZoneCode\*  
 ResultLaboratoryCommentCode\*  
 ResultDetectionQuantitationLimit (0 or more)  
     DetectionQuantitationLimitTypeName\*  
     DetectionQuantitationLimitMeasure  
         MeasureValue  
         MeasureUnitCode\*  
 LaboratoryAccreditationIndicator  
 LaboratoryAccreditationAuthorityName  
 TaxonomistAccreditationIndicator  
 TaxonomistAccreditationAuthorityName  
 LabSamplePreparation (0 or more)  
**LabSamplePreparationMethod**  
     MethodIdentifier  
     MethodIdentifierContext  
     MethodName  
     MethodQualifierTypeName  
     MethodDescriptionText  
 PreparationStartDate  
 PreparationStartTime  
     Time  
     TimeZoneCode\*  
 PreparationEndDate  
 PreparationEndTime  
     Time  
     TimeZoneCode\*  
 SubstanceDilutionFactorNumeric

# Results Part 1

- Biological Result
  - Intent
    - Different business rules associated with intents
  - Subject Taxonomic Name
    - Not reported as Characteristic
  - Group Summary Count Weight
  - Taxonomic Details
  - Frequency Class Info.

```
BiologicalResultDescription
  BiologicalIntentName*
  BiologicalIndividualIdentifier
  SubjectTaxonomicName*
  UnidentifiedSpeciesIdentifier
  SampleTissueAnatomyName*
  GroupSummaryCountWeight
  MeasureValue
  MeasureUnitCode*
  TaxonomicDetails
    CellFormName*
    CellShapeName*
    HabitName* (0 to 3)
    VoltinismName*
    TaxonomicPollutionTolerance
    TaxonomicPollutionToleranceScaleText
    TrophicLevelName
    FunctionalFeedingGroupName (0 to 3)
    TaxonomicDetailsCitation
      ResourceTitleName
      ResourceCreatorName
      ResourceSubjectText
      ResourcePublisherName
      ResourceDate
      ResourceIdentifier
    FrequencyClassInformation (0 to 3)
      FrequencyClassDescriptorCode*
      FrequencyClassDescriptorUnitCode*
      LowerClassBoundValue
      UpperClassBoundValue
  AttachedBinaryObject (0 or more)
    BinaryObjectFileName
    BinaryObjectTypeCode
```

## Results Part 2

- Analysis Method
- Lab Information
- Sample Preparation

```
ResultAnalyticalMethod
  MethodIdentifier
  MethodIdentifierContext
  MethodName
  MethodQualifierTypeName
  MethodDescriptionText
ResultLabInformation
  LaboratoryName
  AnalysisStartDate
  AnalysisStartTime
  Time
  TimeZoneCode
  AnalysisEndDate
  AnalysisEndTime
  Time
  TimeZoneCode
ResultLaboratoryCommentCode
ResultDetectionQuantitationLimit (0 or more)
  DetectionQuantitationLimitTypeName
  DetectionQuantitationLimitMeasure
  MeasureValue
  MeasureUnitCode
  LaboratoryAccreditationIndicator
  LaboratoryAccreditationAuthorityName
  TaxonomistAccreditationIndicator
  TaxonomistAccreditationAuthorityName
LabSamplePreparation (0 or more)
  LabSamplePreparationMethod
  MethodIdentifier
  MethodIdentifierContext
  MethodName
  MethodQualifierTypeName
  MethodDescriptionText
  PreparationStartDate
  PreparationStartTime
  Time
  TimeZoneCode
  PreparationEndDate
  PreparationEndTime
  Time
  TimeZoneCode
  SubstanceDilutionFactorNumeric
```

# Questions

- Contact:
  - The STORET Team: [storet@epa.gov](mailto:storet@epa.gov)
  - 1-800-424-9067
- Or Visit:
- [www.epa.gov/storet](http://www.epa.gov/storet)
- [www.epa.gov/storet/wqx.html](http://www.epa.gov/storet/wqx.html)
- [www.exchangenetwork.net/exchanges/water/wqx.htm](http://www.exchangenetwork.net/exchanges/water/wqx.htm)