# Measures to make Horikawa River Limpid.

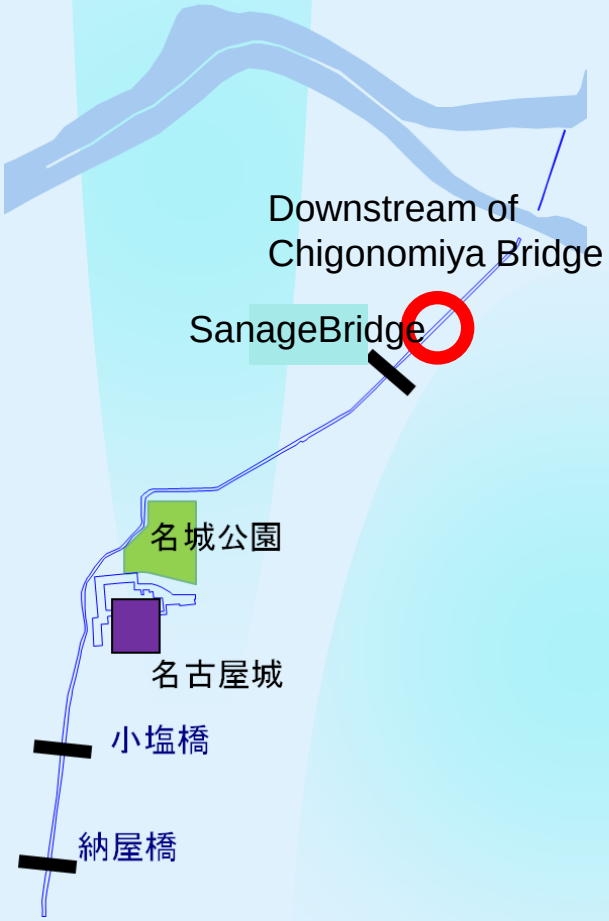
## Implementation by Nagoya City.

Feb.15th.2014

Nagoya City Greenification & PublicWorks Bureau River Dep.
River Plannning Div.

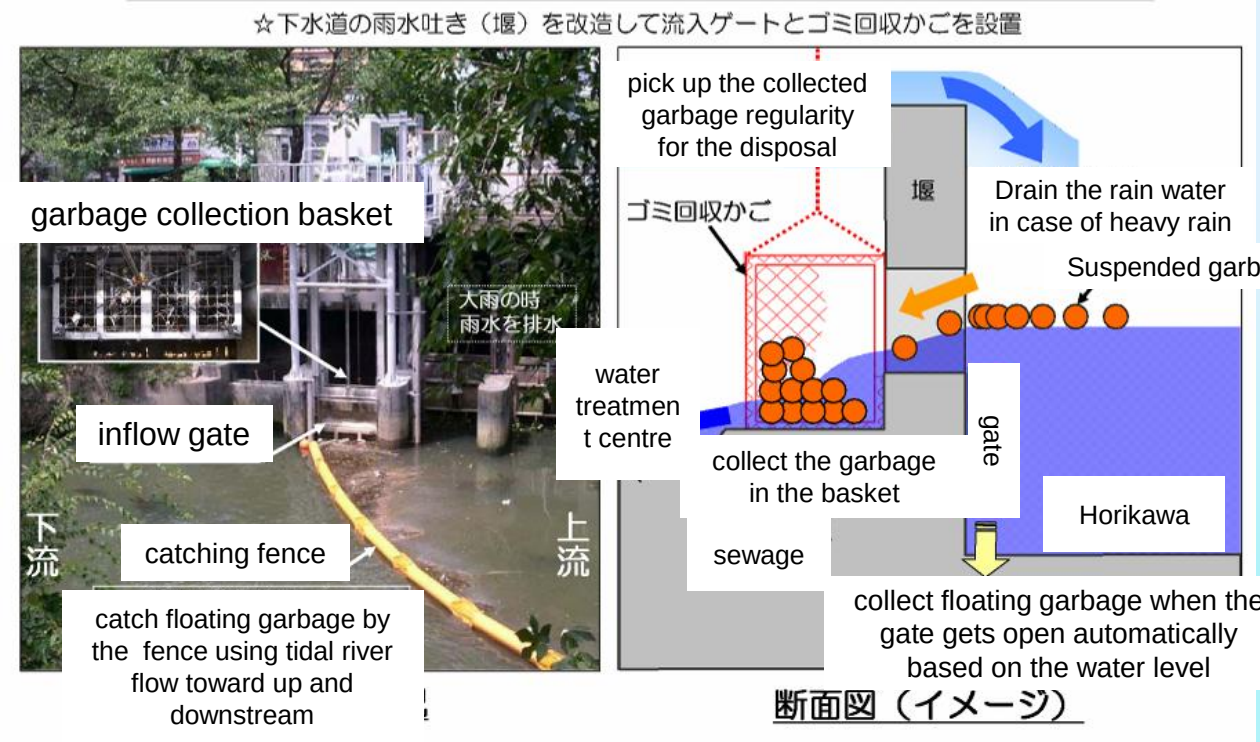
# Reservation of additional water source (FY2013)

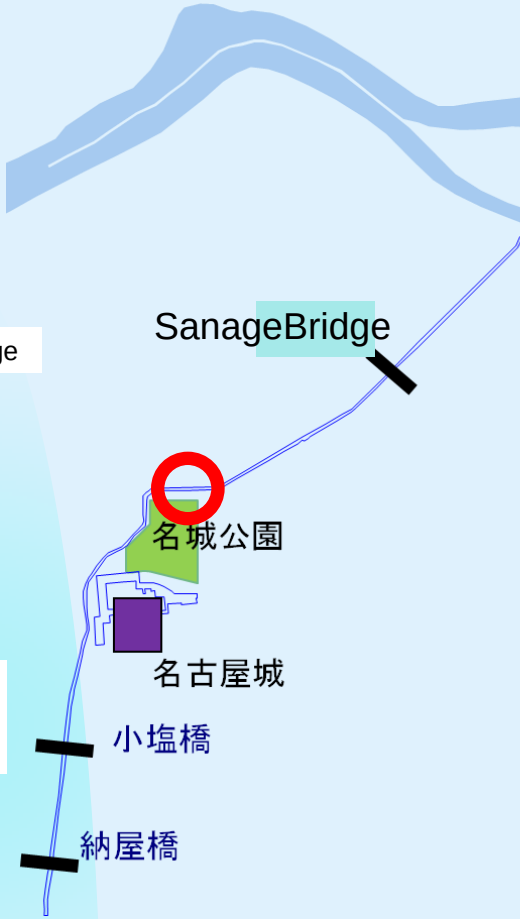
◆Downstream of Chigonomiya Bridge
transmitted into Horikawa River(0.01m³/s)




# Removal and inflow reduction of pollutants.

◆Garbage Catcher(near Johoku Bridge) from FY2006

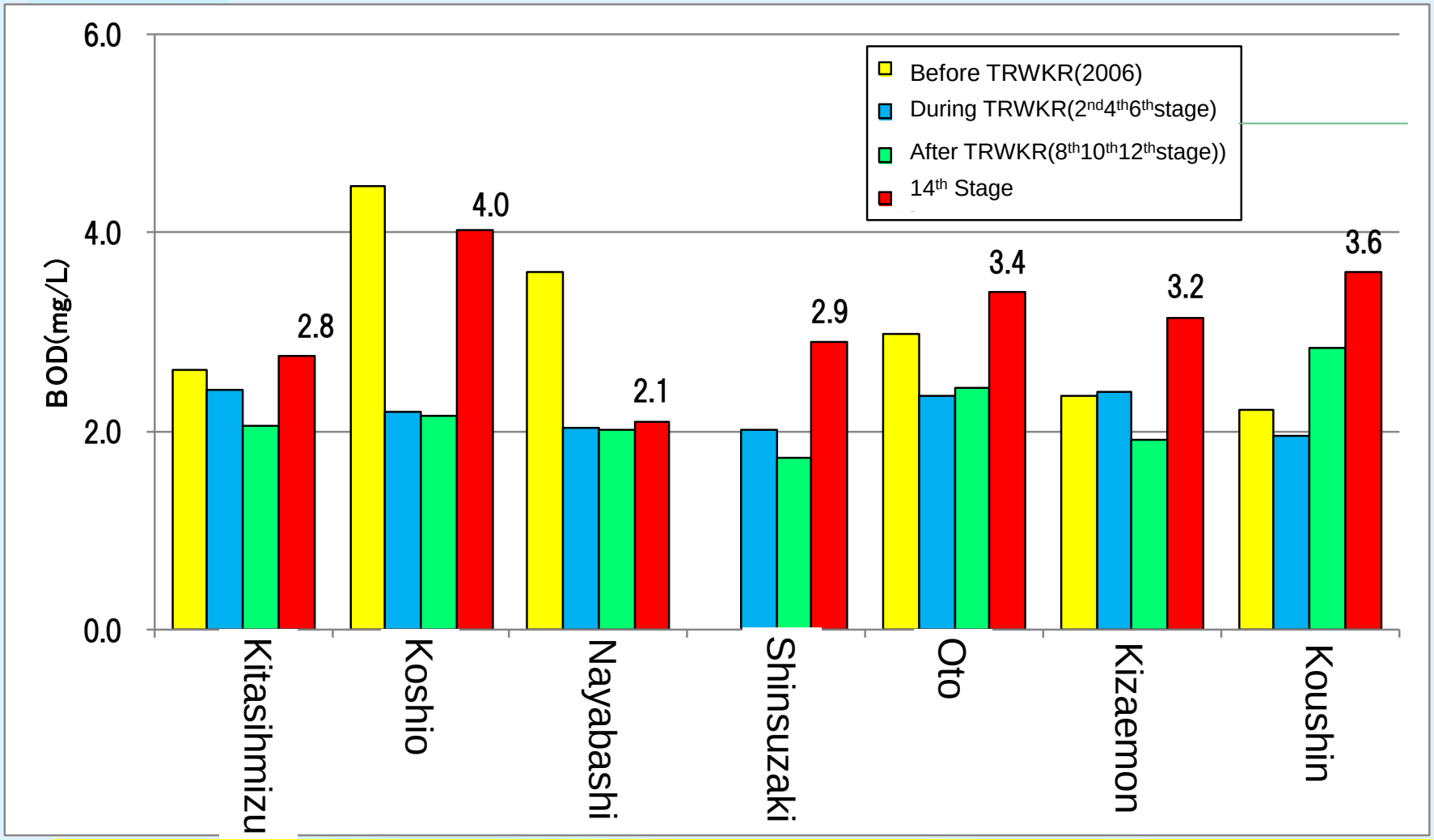



| | |
|---|---|
| FY 2010 collected | 2．4t |
| FY 2011 collected | 2．3t |
| FY 2012 collected | 1．1t |

# Result of water quality survey by Greenification & public warks Bureau

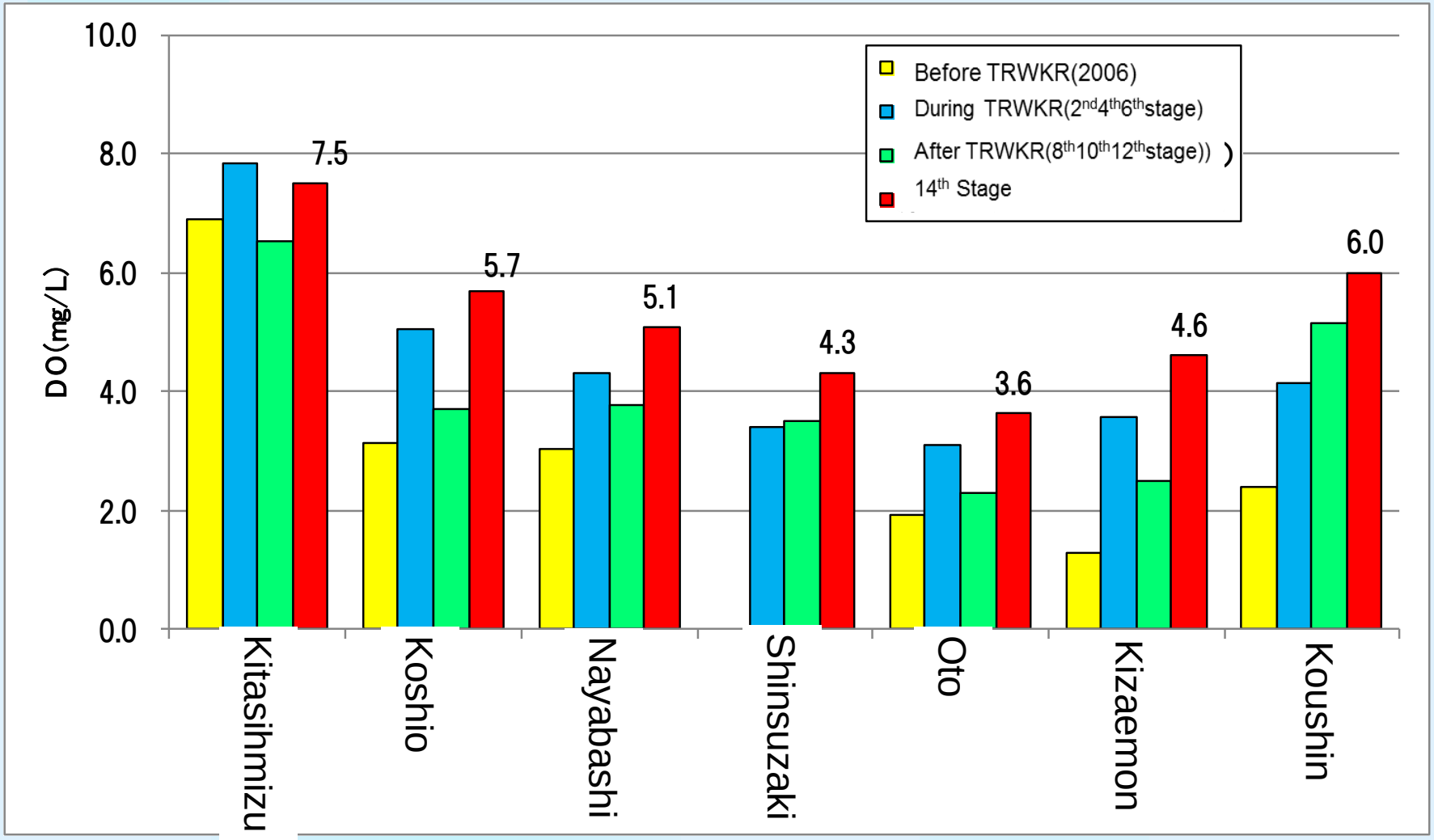
BOD




**BOD level was high on 14th stage at all points(without Nayabashi Bridge)**

# Result of water quality survey by Greenification & public warks Bureau

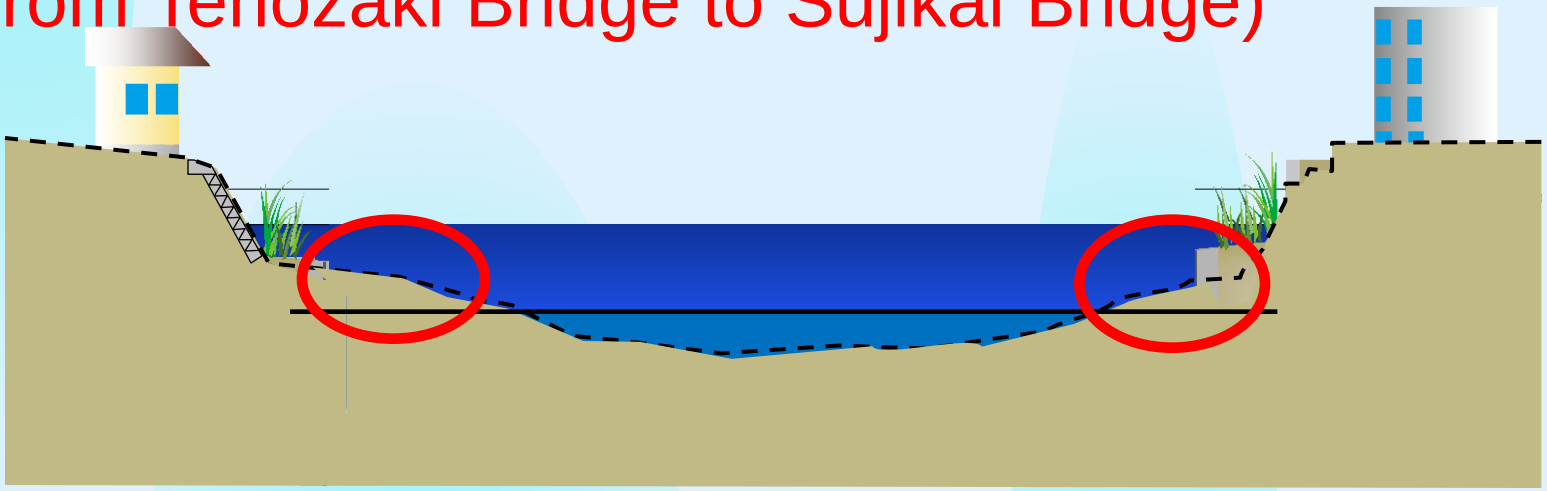
DO




***DO level was higher on 14th stage than during TRWKR at all points without Kitashimizu Bridge near Sanage Bridge.***

# Outline of Surveys

- We implemented Several surveys to consider clarification measures focused on the sludge appeared on the ebb tide.
(from Tenozaki Bridge to Sujikai Bridge)



# Outline of Surveys

【items】

- Sludge accumulation

→ check the situation by measuring.

- Deterioration of existing revetment

→ check the effect of removing sludge on the existing revetment

- Water quality

→ check during the ebb tide at Nayabashi and Koshio Bridge

items items：**BOD,COD,SS,T−N,T−P** etc.

- Odor

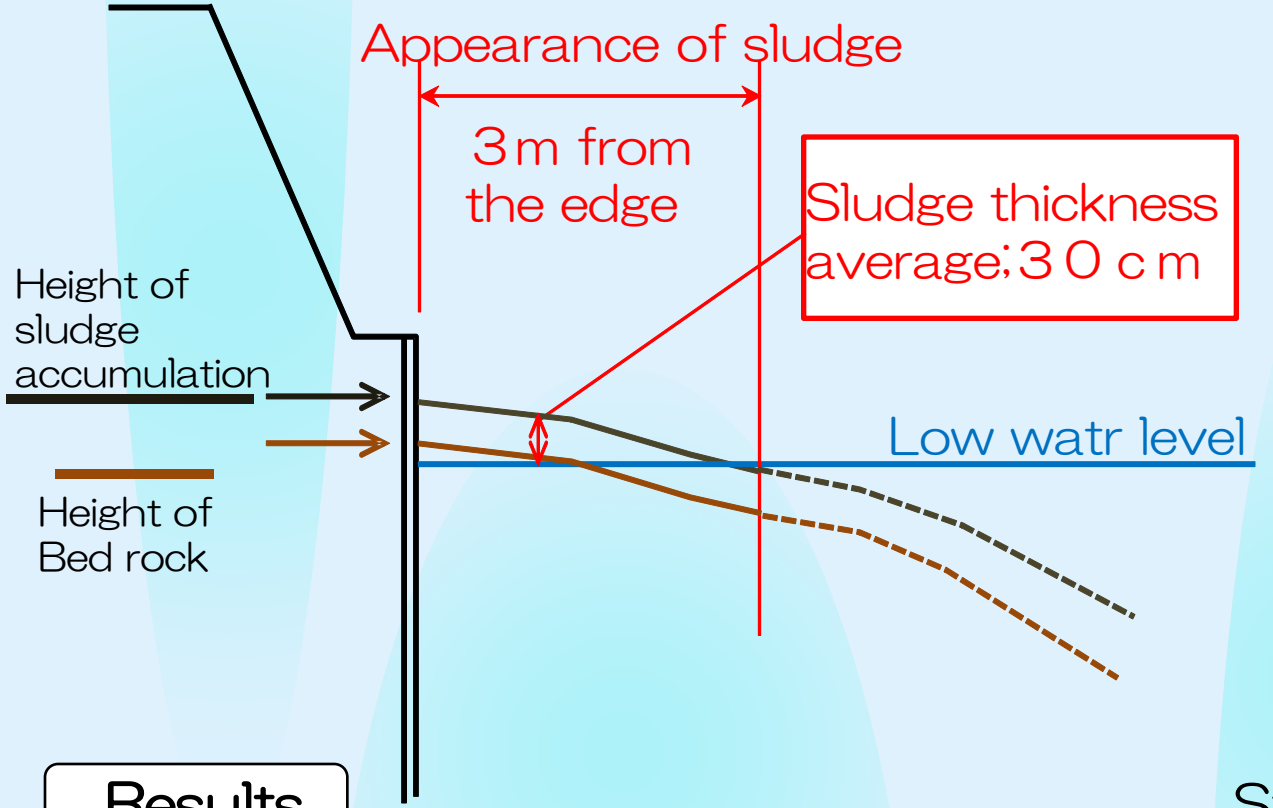
→ focused on the difference between the smell at the time of Sludge appeared and that of sludge submerged.

Items: Ammonia, H2S, Methyl mercaptan, Trimethylamine

- Experts hearing

# Interim report(Naka Bridge～Gojo Bridge)

## ○ Survey of Sludge accumulation




Sludge on surface

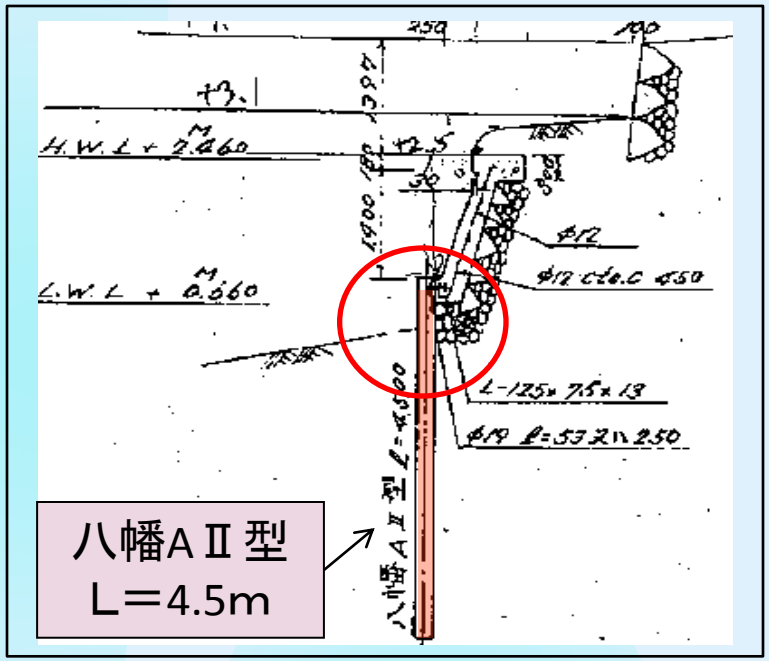
Stones of the lower layer

Results

- Sludge layer is about 30cm thick on average (min 4cm, max 66cm)
- there are many stones on the lower layer at the almost all points

# Interim report（Naka Bridge～Gojo Bridge）

## ○ Survey of deterioration of existing revetment




Structural Drawing（S7～8 established）

Measuring of Sheet pile thickness

Becoming hollow at sheet pile damaged

**Results**

- **We found the standard of the sheet pile. The sheet pile has not been repaired and embedment depth is shallow.**
- **We found erosion of an exposed part and deteriorated part.**
- **As the result of this survey and the stability analysis, we found it hard to remove sediment on the sheet pile.**
- **Revetment become more instable when the water level is low.**

# Interim report（Naka Bridge～Gojo Bridge）

## ○ Odor survey

**We survey**

**○the accumulating odor when the sludge appeared**

**○the accumulating odor when the sludge is submerged**

**○the odor emitted by the sludge collected**

**Results**

**●We found H2S when the sludge appeared at the ebb tide.**

**（that level exceeds regulation level of the offensive odor control low.）**

**●We found coliform group exceeds regulation level of the water pollution prevention act.**

***River is not itself subject of the offensive odor control low and the water pollution prevention act.**

We have an exparts' hearing after these surveys

# Exparts'hearing

**Opinions**

**◎About clarification measures.**

- **Overlaying sand is one of the suited way.**
- **It's better to improve clarification measures as mixing clarification goods with overlaying sand.**
- **We had better try to improve Horikawa River bottom sediment with a columnar improvement.**
- **We oppose the vegetation for water clarification because its maintenance require much effort and it remain as an organic matter if we don't collect.**
- **Measure to H2S is important when we take in account an odor or an organism living.**

**◎About damming**

- **It's impractical to dam because of a flood control, an inflow water and an ebb and flow of the tide.**
- **There is a possibility the deteriorated revetment crumbled due to releasing a water pressure by damming.**
- **There are some problems of odor or sanitation in public participation.**