Below is an **exact, cell–reference mapping** from *STEPPED DISCHARGE TEST & RECOVERY* Excel to a Firestore document.

1) Suggested Firestore location

- **Collection**: step_discharge_tests
- **Document ID**: recommend "<boreholeNo>_<yyyymmdd>_<HHmm>" (derived from boreholeNo + first test date + first time), or autoId.

---

2) Header / Metadata → single cells (A1 notation)

All cells are on Sheet1. Units are shown as suffixes in field names for clarity.

Firestore field	Excel cell
projectNo	**B5**
mapReference	**G5**
province	**L5**
boreholeNo	**B6**
latitude	**G6**
district	**L6**
altBhNo	**B7**
longitude	**G7**
siteName	**L7**
elevation_m	**G8**
boreholeDepth_m	**B9**
datumAboveCasing_m	**G9**
existingPump	**L9**

Firestore field	Excel cell
waterLevel_mbdl	**B10**
casingHeight_magl	**G10**
contractor	**L10**
depthOfPump_m	**B11**
diamPumpInlet_mm	**G11**
pumpType	**L11**
staticWaterLevel_mbch	**B104**

All of the above label positions and value cells were taken from the uploaded template and confirmed against the sample's structure. [APT - STEP...ECOVERY(2) | Excel], [KMDW10 - S...HARDE TEST | Excel]

---

3) Time-series blocks (Discharge rates & Recovery)

Each block has a **date cell**, **time cell**, and **column ranges** for the data table.\ Store these under a nested object like steps.{rateId} where rateId ∈ discharge_rate_1 … discharge_rate_6, recovery.

3.1 Discharge Rate 1

- steps.discharge_rate_1.date → **B14** (Excel date)
- steps.discharge_rate_1.time → **E14** (Excel time)
- steps.discharge_rate_1.readings (columns / ranges):
    - time_min → **A17:A104**
    - water_level_m → **B17:B104**
    - drawdown_m → **C17:C104**
    - yield_ls → **D17:D104**

3.2 Discharge Rate 2

- steps.discharge_rate_2.date → **G14**

- steps.discharge_rate_2.time → **J14**
- steps.discharge_rate_2.readings:
    - time_min → **F17:F103**
    - water_level_m → **G17:G103**
    - drawdown_m → **H17:H103**
    - yield_ls → **I17:I103**

3.3 Discharge Rate 3

- steps.discharge_rate_3.date → **B45**
- steps.discharge_rate_3.time → **E45**
- steps.discharge_rate_3.readings:
    - time_min → **A48:A104**
    - water_level_m → **B48:B104**
    - drawdown_m → **C48:C104**
    - yield_ls → **D48:D104**

3.4 Discharge Rate 4

- steps.discharge_rate_4.date → **G45**
- steps.discharge_rate_4.time → **J45**
- steps.discharge_rate_4.readings:
    - time_min → **F48:F103**
    - water_level_m → **G48:G103**
    - drawdown_m → **H48:H103**
    - yield_ls → **I48:I103**

3.5 Discharge Rate 5

- steps.discharge_rate_5.date → **B75**
- steps.discharge_rate_5.time → **E75**
- steps.discharge_rate_5.readings:

    - time_min → **A78:A104**
    - water_level_m → **B78:B104**
    - drawdown_m → **C78:C104**
    - yield_ls → **D78:D104**

3.6 Discharge Rate 6

- steps.discharge_rate_6.date → **G75**
- steps.discharge_rate_6.time → **J75**
- steps.discharge_rate_6.readings:
    - time_min → **F78:F103**
    - water_level_m → **G78:G103**
    - drawdown_m → **H78:H103**
    - yield_ls → **I78:I103**

3.7 Recovery

- steps.recovery.date → **L14**
- steps.recovery.time → **O14**
- steps.recovery.readings:
    - time_min → **K17:K103**
    - water_level_m → **L17:L103**
    - recovery_m → **M17:M103**

Note on varying end rows (103 vs 104): The right-hand tables stop one row earlier due to the sheet's layout. In code, you should still **scan until the first blank** in the Time column so you're not tied to a fixed row count. The coordinates above reflect what's actually present in the uploaded files. [APT - STEP...ECOVERY(2) | Excel], [KMDW10 - S...HARDE TEST | Excel]

---

4) Optional water-quality mini-fields (where present in the template)

When included in the template, they sit near the bottom of the respective page block:

Step	pH	temp_C	ec_uScm
discharge_rate_3	**G71**	**G72**	**G73**
discharge_rate_4	**G71**	**G72**	**G73**
discharge_rate_5	**G101**	**G102**	**G103**
discharge_rate_6	**G101**	**G102**	**G103**

The template region for discharge_rate_1 and discharge_rate_2 does not include these cells explicitly (they appear between the upper tables and the next block). If you want them for 1 & 2 as well, we can add a fallback search rule anchored on those titles..xlsx\&action=default\&mobileredirect=true) [APT - STEP...ECOVERY(2) | Excel]

---

5) Drop-in A1 mapping JSON for your parser

This JSON is ready to embed in your extraction code. Keys are your Firestore fields; values are A1 cells/ranges to read from Excel.


```
{
  "collection": "step*discharge*tests",
  "fields": {
    "projectNo": "B5",
    "mapReference": "G5",
    "province": "L5",
    "boreholeNo": "B6",
    "latitude": "G6",
    "district": "L6",
    "altBhNo": "B7",
    "longitude": "G7",
    "siteName": "L7",
    "elevation*m": "G8",*
```

```
  "boreholeDepthm": "B9",
  "datumAboveCasingm": "G9",
  "existingPump": "L9",
  "waterLevelmbdl": "B10",
  "casingHeightmagl": "G10",
  "contractor": "L10",
  "depthOfPumpm": "B11",
  "diamPumpInletmm": "G11",
  "pumpType": "L11",
  "staticWaterLevelmbch": "B104"
 },
 "steps": {
  "dischargerate1": {
   "date": "B14",
   "time": "E14",
   "columns": {
    "timemin": "A17:A104",
    "waterlevelm": "B17:B104",
    "drawdownm": "C17:C104",
    "yieldls": "D17:D104"
   }
  },
  "dischargerate2": {
   "date": "G14",
   "time": "J14",
   "columns": {
```

```
    "timemin": "F17:F103",
    "waterlevelm": "G17:G103",
    "drawdownm": "H17:H103",
    "yieldls": "I17:I103"
   }
 },
 "dischargerate3": {
   "date": "B45",
   "time": "E45",
   "columns": {
    "timemin": "A48:A104",
    "waterlevelm": "B48:B104",
    "drawdownm": "C48:C104",
    "yieldls": "D48:D104"
   },
   "quality": { "pH": "G71", "tempC": "G72", "ecuScm": "G73" }
 },
 "dischargerate4": {
   "date": "G45",
   "time": "J45",
   "columns": {
    "timemin": "F48:F103",
    "waterlevelm": "G48:G103",
    "drawdownm": "H48:H103",
    "yieldls": "I48:I103"
   },
```

```
  "quality": { "pH": "G71", "tempC": "G72", "ecuScm": "G73" }
},
"dischargerate5": {
  "date": "B75",
  "time": "E75",
  "columns": {
    "timemin": "A78:A104",
    "waterlevelm": "B78:B104",
    "drawdownm": "C78:C104",
    "yieldls": "D78:D104"
  },
  "quality": { "pH": "G101", "tempC": "G102", "ecuScm": "G103" }
},
"dischargerate6": {
  "date": "G75",
  "time": "J75",
  "columns": {
    "timemin": "F78:F103",
    "waterlevelm": "G78:G103",
    "drawdownm": "H78:H103",
    "yieldls": "I78:I103"
  },
  "quality": { "pH": "G101", "tempC": "G102", "ecuScm": "G103" }
},
"recovery": {
  "date": "L14",
```

```
    "time": "O14",
    "columns": {
      "time*min": "K17:K103",
      "water*level*m": "L17:L103",
      "recovery*m": "M17:M103"
    }
  }
 }
}
```


Coordinates above were derived from the attached **template** and validated against your **sample** workbook (date/time examples at B14/E14, G14/J14, L14/O14, etc.). [APT - STEP...ECOVERY(2) | Excel], [KMDW10 - S...HARDE TEST | Excel]

---

6) Parsing & validation tips (so it's production-safe)

- **Dates/times**: Excel stores dates/times as serials. Convert to ISO strings (UTC) before writing to Firestore.
- **Numeric coercion**: Force columns to number and **drop trailing empty rows** (stop at first blank time).
- **Monotonic time**: Ensure time_min is non-decreasing and starts at 0.
- **Units**: Keep values in **meters** and **L/s** as per the sheet; store units in field names (as above) to avoid ambiguity.
- **Drawdown check**: Optional rule—drawdown_m ≥ 0 and water_level_m should respond consistently with yield.
- **Consistency**: If any date/time cell is blank in a rate, inherit from the **nearest populated rate above** (as seen in your sample, DR4 date/time may be left blank). [KMDW10 - S...HARDE TEST | Excel]

Here's a breakdown of the key fields from your populated file (KMDW09 CONSTANT DISCHARGE AND RECOVERY.xlsx) and their corresponding cell references. I'll organize them into **metadata fields** (borehole info, contractor, pump details) and **test data fields** (time series discharge/recovery).

1. Borehole Metadata

Firestore Field	Excel Cell Reference	Example Value
borehole_no	B5	KMDW 09
site_name	B11	KAMISENGO
contractor	B7	APT
client	B13	LMC
borehole_depth	B15	(value not shown in populated file)
datum_level_above_casing_m	B16	(value not shown)
existing_pump	B17	NEW HOLE
water_level_m	B18	2.74
casing_height_m	B19	0.37
depth_of_pump_m	B21	100.5
diameter_pump_inlet_mm	B22	230.0
pump_type	B23	WA110-2

---

2. Test Metadata

Firestore Field	Excel Cell Reference	Example Value
test_started	B26	(blank in populated file)
test_completed	B27	(blank in populated file)
test_date	B28	46296.0 (Excel serial date → 2026-09-09)

Firestore Field	Excel Cell Reference	Example Value
start_time	B29	09:30:00

---

3. Time Series Data (Constant Discharge & Recovery)

This is the **main table** starting around **Row 34 onward**. Each row represents a time interval.

Firestore Field	Excel Column	Example (Row 34)
time_min	Column A	0.0
water_level_m	Column B	2.74
drawdown_m	Column C	0.0
yield_lps	Column D	0.0
recovery_time_min	Column E	0.0
recovery_water_level_m	Column F	6.8
obs_hole2_level_m	Column H	0.0
obs_hole3_level_m	Column J	0.0

👉 Each subsequent row (Row 35, Row 36, etc.) continues the time series.
This should be stored in Firestore as a **subcollection** or an array of objects, e.g.:


```
"test_data": [
 {
  "time_min": 0.0,
  "water_level_m": 2.74,
  "drawdown_m": 0.0,
  "yield_lps": 0.0,
  "recovery_time_min": 0.0,
  "recovery_water_level_m": 6.8
 },
```

{

"time_min": 0.5,

"water_level_m": 4.79,

"drawdown_m": 2.05,

"yield_lps": 0.5,

"recovery_time_min": 0.5,

"recovery_water_level_m": 6.8

}

]

---

4. Summary Fields

At the bottom of the sheet: | Firestore Field | Excel Cell Reference | Example Value | |---------|----------|----------| | total_time_pumped_min | B1442 | 14400.0 | | average_yield_lps | B1443 | (calculated, ~2.2) | | available_drawdown_m | B1444 | 97.76 |

📂 **Suggested Firestore Structure**

Here's how you can structure the Firestore document:

{

"borehole_no": "KMDW 09",

"site_name": "KAMISENGO",

"contractor": "APT",

"client": "LMC",

"water_level_m": 2.74,

"casing_height_m": 0.37,

"depth_of_pump_m": 100.5,

"diameter_pump_inlet_mm": 230.0,

```
 "pump_type": "WA110-2",
 "test_date": "2026-09-09",
 "start_time": "09:30:00",
 "summary": {
  "total_time_pumped_min": 14400,
  "average_yield_lps": 2.2,
  "available_drawdown_m": 97.76
 },
 "test_data": [
  { "time_min": 0.0, "water_level_m": 2.74, "drawdown_m": 0.0, "yield_lps": 0.0 },
  { "time_min": 0.5, "water_level_m": 4.79, "drawdown_m": 2.05, "yield_lps": 0.5 },
  ...
 ]
}
```
